

# JOURNAL OF THE BOMBAY NATURAL HISTORY SOCIETY

August 1997

Vol. 94

No. 2

## THE EFFECT OF INDIRA GANDHI NAHAR PROJECT ON THE AVIFAUNA OF THE THAR DESERT<sup>1</sup>

Asad R. Rahmani<sup>2</sup>

*(With two text-figures)*

**Key words:** Thar desert, canal, avifauna, checklist, environmental impact

The 208,000 sq.km Thar desert is one of the smallest deserts in the world. Being at the crossroads of the Palaearctic and Oriental biogeographical regions, the Thar has high avian diversity of nearly 250 species. The Thar has a very high human density, which is exerting tremendous pressure on the fragile ecosystem. The development of the Indira Gandhi Nahar Project (IGNP) during the last two decades has resulted in large scale ecological changes. Traditional crops have been replaced by cash crops, which need more water. Owing to the misuse of irrigation facilities, water logging and salinity is increasing all along the IGNP. Canal-side plantations and seepage wetlands, now attract many new forest and wetland birds. Shikra, honey buzzard, yellow-legged green pigeon, roseringed parakeet, jungle babbler, striated babbler, crow pheasant, whitebrowed fantail flycatcher and paradise flycatcher are spreading through linear plantations on both sides of the canal, and ducks, waders, egrets, herons etc. are becoming common. The common crane is also spreading along the IGNP. During four surveys in 1993 and 1994, 213 species of birds were identified, nearly half being non-desert taxa. Purely desert and dry grassland birds such as the great Indian bustard, houbara, cream-coloured courser, desert lark, hoopoe lark and whitebrowed bushchat are decreasing, some at an alarming rate. Despite the IGNP being perhaps the longest desert irrigation canal in the world, no environmental impact assessment has been done.

### INTRODUCTION

The Thar desert occupies nearly 9% of India's geographical area and covers more than 208,000 sq.km. It extends into Pakistan but nearly 62% is present in eleven districts of western Rajasthan and parts of Kutch. A major portion of the Thar desert is occupied either by

dry open grassland or by grassland interspersed with trees and thorny bushes (Gupta, 1975a). Sand dunes are present in nearly 58% of the area (Shankarnarayan, 1988).

One of the smallest deserts in the world, the Thar has a high avian diversity, from its location on the crossroads of the Palaearctic and Oriental biogeographic regions. It is connected to the Sahara desert via Persian and Arabian deserts, and shows avian affinity with these deserts, and to some extent with the Ethiopian region (e.g. bustards, coursers, francolins).

<sup>1</sup>Accepted September, 1995.

<sup>2</sup>Centre of Wildlife & Ornithology, Aligarh Muslim University, Aligarh 202 002, India

Present address: Bombay Natural History Society, S.B. Singh Road, Hornbill House, Mumbai 400 023

As the Thar desert is not isolated, avian endemism is very low. To the west it is connected through the Sind plains with the Persian and then Arabian deserts, on the north lie the fertile plains of the Punjab, to the northeast the Gangetic plain, and to the east, it joins the semi-arid plains of the Deccan. In the south, it merges with the Rann of Kutch. Most species of birds of the Thar have a wide distribution. Stoliczka's whinchat or whitebrowed bushchat *Saxicola macrorhyncha* is one of the endemic birds. The low degree of endemism is also due to the fact that most birds are highly mobile, and to evolve into localized endemic species, need very effective barriers, either physical or ecological, which in the case of the Thar are generally absent.

Although no detailed work on the avifauna of the Indian Thar has been done, nearly 250 species of birds have been recorded by various workers such as Adam (1873, 1874), Barnes (1886), Ticehurst (1922), Whistler (1938), and Rahmani (1994).

#### BRIEF HISTORY OF ORNITHOLOGY IN THE THAR

The Thar, including the Sind region in Pakistan, has a long history of human occupation. Perhaps the first scientific bird study which included the Thar was by R. M. Adam in 1873 and 1874, in the first ornithological journal of India, *Stray Feathers* (vol. 1 and 2). Although the major emphasis of these two papers was on the birds of Sambhar Lake, nearby areas were also covered. Later, E. A. Butler's 'Notes on the avifauna of Mount Aboo and northern Gujarat', in *Stray Feathers* (vol. 3, 4, and Addendum in vol. 5) in 1875 and 1876 also partly dealt with the birds of the Thar desert.

The first exclusive study on the birds of the Thar (Sind province) was by Scrope Doig, who while constructing the east Nara canal in the 1870s kept extensive notes and later published them in the form of two papers: 'Birds Nesting on the Eastern Nara Sind', *Stray Feathers*, (8, pp 369-379), and 'Birds Nesting on the Eastern

Nara, (Sind) Additions and Alterations', *Stray Feathers* 9, pp 277-282. At about the same time H. E. Barnes in 1886, published a paper 'Birds nesting in Rajpootana', in the first issue of the *JBNHS*. Later he published another article 'Nesting in western India', in seven parts in the same journal (1888-1890). This paper also covered birds of the Thar desert. Hume (1873, 1877a, b, 1878) also wrote extensively on the birds of Sind, including the Thar desert.

In the first few decades of this century, three eminent ornithologists studied the avifauna of the Thar and Sind. Claude B. Ticehurst between 1922 and 1924, published 'Birds of Sind' in eight parts, in the British journal *Ibis*. He also collected nearly 1500 specimens which are lodged in the British Museum (Natural History). The doyen of Indian ornithology, Hugh Whistler published an exhaustive paper 'The Ornithological Survey of Jodhpur State', in 1938 in *JBNHS*, based on the birds collected and seen by La Personne in 1933-34. He also incorporated the works of R. M. Adam, A. O. Hume (Birds of a Drought, *Stray Feathers*, 6), and King, who collected birds at Mount Abu (=Aboo) and Jodhpur for nearly two years but never published his findings.

K. R. Eates, a police officer posted in Sind for almost 20 years, between 1926 and 1943 published many interesting notes in *JBNHS*, on the breeding birds of Sind (Eates 1937, 1939). Dr. Salim Ali unfortunately never got the opportunity to work in the Thar desert of Rajasthan but his, and Dr. Dillon Ripley's monumental 10 volumes 'The Handbook of the Birds of India and Pakistan' extensively cover the birds of the Thar desert.

With the establishment of Central Arid Zone Research Institute (CAZRI) at Jodhpur, extensive work on desert ecology was started but not much work was done on the avifauna, except for brief notes on sighting and rarity of the great Indian bustard by Ishwar Prakash and P. K. Ghosh (1963, 1964). Rana *et al.* (1994) of CAZRI have made some unreliable checklists of the birds of



the Thar, which incidentally even include extinct species such as the pink-headed duck *Rhodonessa caryophyllacea* !

Recently, T. J. Roberts (1991, 1992) has written a seminal book, 'The Birds of Pakistan' which will always be indispensable for oriental ornithologists. This excellent book is in two parts and describes almost all the birds found in the Indian Thar desert.

Between 1990-94, raptors of the Thar desert were studied by Vibhu Prakash of the BNHS, under a large project on raptors of India, funded by the U.S. Fish & Wildlife Service. The results of this study were published recently in the form of a report. In 1993-94, the Oriental Bird Club, U.K., funded a small project by Harkirat Sangha to study the birds of the Desert National Park.

METHODOLOGY

This paper is based on three major surveys between February 1993 and February 1994, and one brief survey during May 1994.

**First Survey**

It was conducted from 2nd February to 13th March, 1993, and the following areas in the Thar were visited (only important names are given):

Name of the area	District
Taal Chhaper	Churu
Diyatra, Bajju, Gajner, Ecological Task Force (ETF), Chorawala, Modiath	Bikaner
Bap, Phalodi, Khara, Keechan, Dhawa-Doli, Guda-Vishnoian	Jodhpur
Nokh, Nachna, Mohangarh, Ramdeora, Pokhran, Desert National Park (DNP), Phalsund	Jaisalmer
Undu, Shiv, Dhorimanna	Barmer

In the Desert National Park (DNP) the following areas were visited: Sam, Sudasari, Khuri, Phulia, Miyajlar, Bandra, Barsiala and Sotto. Most of these areas have fenced core areas of the Park. While some of these core areas were visited only once or twice, Sam and Sudasari were visited during all four trips.

**Second survey**

The second survey was conducted between 15th July and 23rd August, 1993 in Rajasthan and Gujarat, and the following areas (in the Thar) were visited:

Name of the area	District
Taal Chhaper, Dungargarh	Churu
Diyatra, Bajju, Gajner, Lunkaransar, Sathasar ETF, Pugal	Bikaner
Bap, Phalodi, Lohawat, Kanasar	Jodhpur
Nachna, Mohangarh, DNP, Bhikampur, Nokh	Jaisalmer
Shiv, Dhorimanna, Gandhav, Bhagardha	Barmer

**Third survey**

In one month between 12th January to 12th February, 1994, the following areas were visited:

Name of the area	District
Sambhar Lake, Didwana, Sethranwali, Shri Balaji	Nagaur
Diyatra, Bajju, Gajner, Kolayat, Lunkaransar, ETF, Bap, Arjunsar, Agneu, Dantur	Bikaner
Suratgarh, Badopal	Ganganagar
Bap, Phalodi, Khara, Lohawat, Pilu, Savreej, Osiyan, Keechan, Guda-Vishnoian, Phitkasani, Dangiawas, Kaparda, Jaitaran, Bilara	Jodhpur

Name of the area	District
Bhikampur, Nokh, Digha, Madha, Mohangarh, Khinya, DNP, Dhanana, Phalsund, Rasla, Sankara, Banniyana, Ramdeora, Noda Minor	Jaisalmer

The Sonkhaliya bustard area in Ajmer district, was also visited for two days.

#### Fourth survey

A brief survey of one week was conducted in Jodhpur, Jaisalmer and Barmer districts from 17th to 23rd May, 1994, and the following areas were visited:

Name of the area	District
Phalodi, Khara	Jodhpur
Ramdeora, DNP, Rasla	Jaisalmer
Shiv, Dhorimanna	Barmer

The Indian Thar desert has 11 districts and is divided from the semi-arid scrubland of eastern Rajasthan, through the Aravalli mountains (Fig. 1). Except Jhunjhunu, all the 11 districts of the Thar were visited during the surveys, though more thorough surveys were conducted in Bikaner, Jodhpur, Jaisalmer and Barmer districts. Nearly 10,000 km were covered in four surveys, and 125 censuses were conducted. Roadside census of all wildlife was done in a slow moving vehicle. Beside 125 roadside censuses, 38 line transects of 1.5 to 2 km were randomly conducted on foot. These censuses were mainly conducted during the third and fourth surveys. Moreover, a general account of birds was kept even while we were not doing the census or line transect. The whole length of the IGNP from Chhattergarh to Mohangarh was surveyed. Additionally, areas near tributaries and channels were also visited to study the changes in animal life. Frequent stops were made near crop fields and seepage wetlands to study bird life. All the three protected areas (see below) and many Vishnoi areas were visited.

This paper deals with the avifauna of the Thar desert of Rajasthan but wherever necessary, comparison is made with the birds found in the adjoining deserts of Pakistan (Fig. 1). Common and scientific names of birds are based on Ali and Ripley (1983, 1987). Wherever necessary, the name of the site and date of sighting are given. The whole IGNP is marked by numbered pillars every 300 metres (RD means reduced distance, and is 300 m in length). Wetlands and plantations can be identified by these marked pillars.

#### INDIRA GANDHI NAHAR PROJECT (IGNP)

Since the early 1960s, the Thar desert has seen tremendous human activity which has greatly affected the wildlife. The greatest change, with far-reaching consequences, was brought about by the development of the Indira Gandhi Nahar Project (IGNP), earlier known as the Rajasthan Canal. Details of the IGNP are given elsewhere (Rahmani, 1989, 1994). However, to understand the conservation problems, I will briefly describe the IGNP.

The Thar desert extended to different princely states (Jaisalmer, Jodhpur, Bikaner) and it was the desire of every ruler to bring water to the thirsty landscape of his state. One of the first attempts to 'green the desert' was made in 1927 by Ganga Singh, ruler of Bikaner, when the 130 km Ganga Canal was constructed, which brought water from River Sutlej and irrigated about 1.4 lakh ha in Ganganagar district.

When India became independent in 1947, plans were developed to bring marginal areas under cultivation to feed the growing population. The Thar with its vast, thinly populated areas was considered a land bank, which could be brought to some use. An ambitious plan was prepared to bring water through canals. Work on the Indira Gandhi Nahar (Canal) Project (IGNP), earlier known as Rajasthan Canal, was started in 1958 but the actual excavation commenced only in 1960. The canal is still not complete. The total length of the main canal is 649 km from Harikke



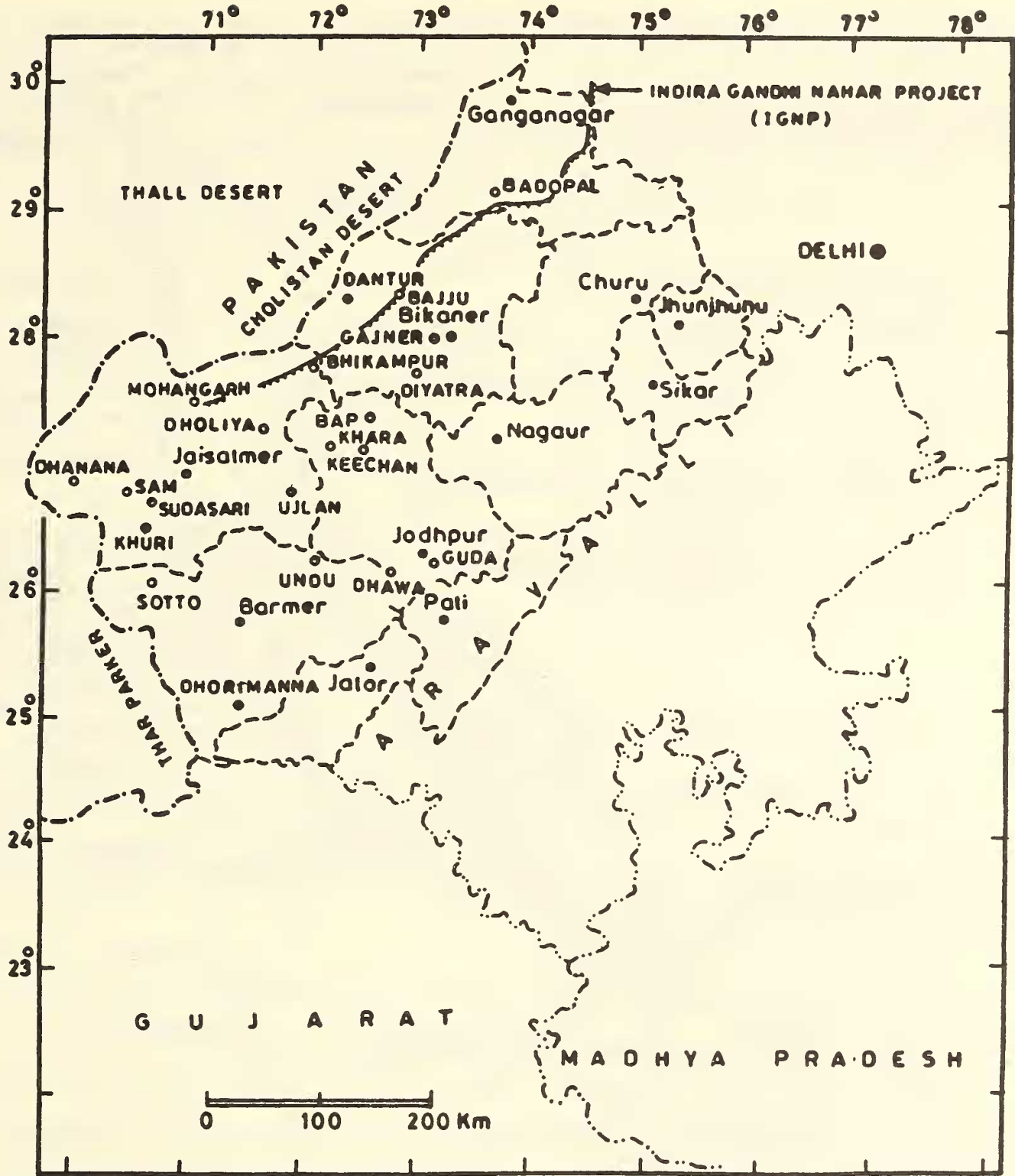


Fig. 1. Map of the study area in western Rajasthan. Only the sites mentioned frequently in the text are indicated by open circles. District headquarters indicated by closed circles.

barrage in Punjab to Mohangarh in Jaisalmer (Fig. 2). In addition to the main canal, feeder channels total nearly 8,000 km in length.

The project was conducted in two stages: Stage I was completed in 1973 and Stage II in 1985 (only the main work). In Stage II, out of the total irrigation potential of 8.10 lakh ha, only 0.6 lakh ha have been created under the lined canal system. The IGNP is one of the largest and the

most expensive irrigation systems in the world. When completed the command area of the IGNP will cover 5,25,000 ha in Stage I and 8,10,000 ha in Stage II, or nearly 11% of western Rajasthan (Chatterji and Saxena, 1988). Arrival of water in the Thar will open up land for colonization, as in Ganganagar district and certain other parts of Rajasthan. The Thar is already the most densely populated desert in the world with the last few

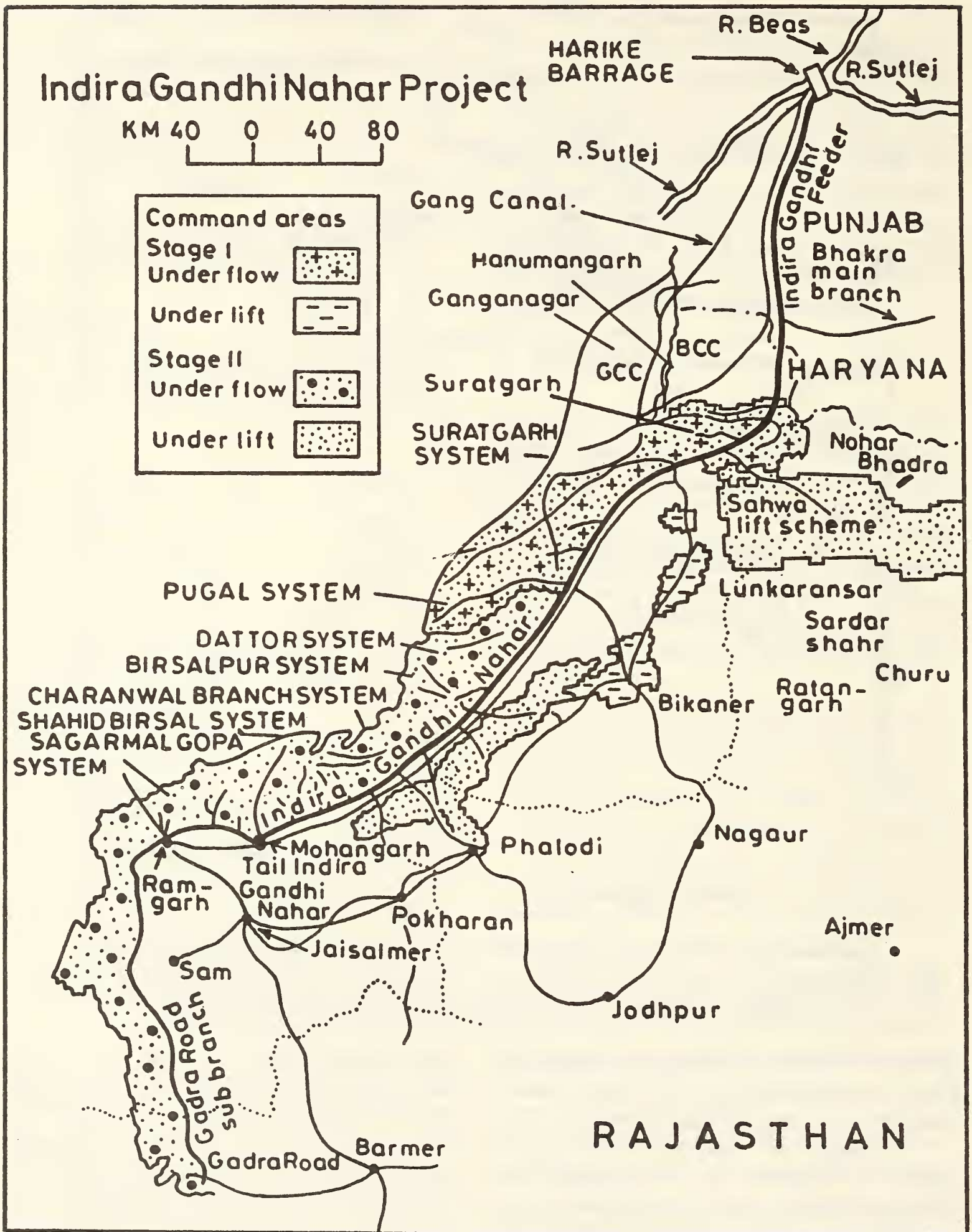


Fig. 2. Details of the Indira Gandhi Nahar Project (thick line). Channels and subdivisions shown by thin lines.



decades having seen an unprecedented rise in human population, from 17.2 sq. km in 1921, 30 in 1961 to 68.4 in 1981 (Dhir, 1988). The increase is both, by immigration (especially in Ganganagar and Bikaner districts) to new canal irrigated areas, and by natural population growth of the local people.

CHANGES IN CULTIVATION PATTERN

The IGNP has also brought tremendous change in the crop pattern from subsistence farming to commercial farming (Gupta, 1975b). Moong *Vigna radiata*, moth *Vigna aconitifolia*, guar *Cyamopsis tetragonoloba*, til *Sesamum indicum*, bajra *Pennisetum typhoides* have been replaced by, groundnut *Arachis hypogea*, cotton *Gossypium* spp., paddy *Oryza sativa*, sugarcane *Saccharum officinarum*, wheat *Triticum sativum* and barley *Hordeum vulgare* (Chatterji and Saxena, 1988).

Apart from land that was cultivated with the development of IGNP, the human population in the whole of Thar brought 44.6% of the marginal land under cultivation in 1951 - 61 and an additional 9.47% during 1961-71 (Mann, 1988).

Changes in vegetation

In the canal irrigated areas, the groundwater table is rising due to seepage from the canals, field channels and irrigated fields (Chatterji and Saxena, 1988). Moreover, owing to leakage in the channels and bad maintenance of the canals, in many places, interdunal reservoirs have been formed where the vegetation cover has changed from xerophytic and psammophytic to hydrophytic and mesophytic plants. Many wetlands are covered by aquatic vegetation such as *Typha angustata*, *Arundo donax*, *Eichhornia crassipes*, *Imperata cylindrica*, *Phragmites* and *Saccharum spontaneum*.

Displacement of grazers

An indirect effect of the expansion of agriculture in western Rajasthan is through the displacement of grazers to non-command areas,

thus exerting even more pressure on the already overgrazed countryside. Due to increase in the population, and the consequent reclamation of land for cultivation, the area available to nomads for grazing their livestock has been shrinking.

Waterbodies and Plantations beside IGNP

Bird life of the Thar desert is changing rapidly due to the development of plantations on both sides of IGNP, and development of large waterbodies due to seepage, which now attract many species which were not seen earlier in the Thar desert (Rahmani, 1994). Many species of waterfowl are seen in the canal and/or in the waterbodies beside the canal (Table 1). Avian diversity has increased, but at the cost of local desert species (see below).

Birds of the protected areas of the Thar desert

There are only three protected areas in the Thar desert:

TABLE I  
FOREST AND WATERBIRDS SEEN IN IGNP

Little Grebe	Little Cormorant
Indian Shag	Cormorant
Darter	Purple Heron
Grey Heron	Large Egret
Chestnut Bittern	Painted Stork
Blacknecked Stork	Barheaded Goose
Common Shelduck	Ruddy Shelduck
Marsh Harrier	White Ibis
Spoonbill	Indian Shikra
Honey Buzzard	Demoiselle Crane
Common Crane	Purple Moorhen
Indian Moorhen	Coot
White-tailed Lapwing	Yellow-legged Green Pigeon
Red Turtle Dove	Rose-ringed Parakeet
Crow-pheasant	Collared Scops Owl
Small Minivet	Jungle Babbler
Striated Babbler	Great Reed Warbler
Paradise Flycatcher	White-browed Fantail Flycatcher
Baya	

- a) The Desert National Park (DNP) is spread over 3,162 sq. km in Jaisalmer and Barmer districts. Presently, the area is technically not a national park, because under the Wildlife (Protection) Act 1972, a park should not have any private human habitation, but in the DNP there are 37 villages (Rahmani, 1989, 1994).
- b) Gajner Sanctuary (30 sq.km) was established in 1905, by the erstwhile Maharaja of Bikaner, for wildlife viewing and hunting. After India's Independence and merger of the princely States, the Gajner sanctuary went under litigation, as a result of which the wildlife came under the control of the Forest Department, but the land remained with the princely family. This dual control has devastated the sanctuary. Gajner has a large water tank which attracts a large number of waterfowl and sandgrouse. It was world famous for imperial sandgrouse *Pterocles orientalis* shoots organized by the Maharaja. Owing to the development of the IGNP and resultant seepage wetlands, the importance of Gajner tank as a water-fowl refuge has diminished, but it still harbours a few hundred ducks, coots, egrets, herons and waders (Rahmani, 1994).
- c) The 7.22 sq. km Taal Chhaper in Churu district, notified as a sanctuary in 1962, is a vast expanse of treeless depression which used to get inundated during good rainfall years. However, as the district falls under the arid zone, rainfall is generally insufficient to inundate the sanctuary. Therefore, for most of the year, the depression or *taal* remains dry. This tiny sanctuary is famous for blackbuck *Antelope cervicapra*, demoiselle crane *Anthropoides virgo* and barheaded goose *Anser indicus* (Rahmani, 1994).

The birds of these three protected areas have been described in detail elsewhere (Rahmani, 1994).

### Annotated checklist of birds seen in the Thar desert

#### 1. Little Grebe *Tachybaptus ruficollis*

Common in village tanks and seepage wetlands of IGNP. During 1993-94, a total of 180 seen in Taal Chhaper, Gajner, Kolayat, Diyatra, Bap, Guda-Vishnoian, Keechan and Khinya, in Sambhar Lake, and seepage wetlands near Lunkaransar, RD 764 and Noda Minor. Parents and chicks found in a seepage wetland at RD 954 near Bajju, in Bikaner dist. on 17 July, 1993.

#### 2. Great Cormorant *Phalacrocorax carbo*

Earlier uncommon but now spreading with seepage wetlands of the IGNP. 26 individuals seen during winter and monsoon surveys, none during May 1994. Four birds in Gajner tank, all others on seepage wetlands, e.g. 16 roosting near RD 954 on 8 February, 1993.

#### 3. Indian Shag *Phalacrocorax fuscicollis*

Uncommon. Ten roosting on a dry tree in RD 954 near Bajju on 17 July, 1993. On 23 January, 1994, possibly this species in flight over IGNP near RD 860.

#### 4. Little Cormorant *Phalacrocorax niger*

Common and spreading with seepage wetlands of IGNP. Noticed in Gajner, Bajju, Bangasar Lift Canal, Guda-Vishnoian, Nachna, Kolayat, Noda Minor and Suratgarh. Nearly 200 found roosting near Badopal near Suratgarh in Ganganagar dist..

#### 5. Darter *Anhinga melanogaster*

Rare in the Thar. One seen on 21 January, 1994, in a large waterspread near RD 507, where fishermen were active.

#### 6. Chestnut Bittern *Ixobrychus cinnamomeus*

One seen flying over the reed covered canal near Mohangarh in Jaisalmer dist., on 21 July, 1993. Roberts (1991), found it widespread in



suitable habitat, common in east Nara and Thatta dist. (Thar, Pakistan).

**7. Little Green Heron *Butorides striatus***

Uncommon. Only one seen on 17 July, 1993, near Bajju on a seepage wetland.

**8. Pond Heron *Ardeola grayii***

Not uncommon in village tanks, and seepage ponds perhaps spreading with IGNP. Fourteen individuals seen on six sites during winter and monsoon.

**9. Cattle Egret *Bubulcus ibis***

Uncommon, only three sightings. Two sightings near IGNP (RD 954 and Mohangarh) and once a flock with sheep between Nokh and Bap on 18 July, 1993. A few days earlier, very heavy rains had occurred in the area. Likely to increase with the spread of agriculture along the IGNP.

**10. Little Egret *Egretta garzetta***

Not uncommon in suitable habitats. Twenty in Kolayat tank (7 February, 1993) and 6 near RD 954 near Bajju (8 February, 1993). One individual was without yellow legs. It could have been a Reef heron *Egretta gularis*. Little Egret spreads out more widely during the monsoon. For instance, 10 seen flying over the grasslands of Sudasari on 24 July, 1993.

**11. Intermediate Egret *Egretta intermedia***

Uncommon. Only three records, one each from Gajner (16 January), Diyatra tank (17 January) and seepage of Noda Minor (21 January, 1994).

**12. Large Egret *Egretta alba***

Rare, but could become more common with the development of large seepage waterbodies. One seen on Samra water tank near Nokh on 28 January, 1994 and two in a seepage near RD 507 on 20 January, 1994

**13. Grey Heron *Ardea cinerea***

Uncommon, only 16 records from eight sites. In future it will become more common in the Thar desert with the development of seepage wetlands.

**14. Purple Heron *Ardea purpurea***

Uncommon, only five records from four seepage wetlands of the IGNP.

**15. Painted Stork *Mycteria leucocephala***

Rare. Three seen inside Suratgarh town on 20 January, 1994. Likely to spread with the IGNP.

**16. Openbill Stork *Anastomus oscitans***

Rare, only two seen on 29 January, 1994 in a seepage wetland at RD 507. Roberts (1991) found it a rare winter visitor in Pakistan; he does not have any recent record from the Thar or Cholistan deserts.

**17. Black Stork *Ciconia nigra***

Rare winter migrant to the Thar. Only three, including an immature, seen on 28 January, 1994, about 250 m from a waterbody near Samra village, at the edge of Rann of Nokh, in Jaisalmer dist.

**18. Whitenecked Stork *Ciconia episcopus***

Whistler (1938), has not listed this species in the birds of Jodhpur State. I saw one individual on a wetland near Guda-Vishnoian Rest House on 7 March, 1993. Perhaps the first record from the Thar. Roberts (1991), say that it is not found in the Pakistan desert regions.

**19. Blacknecked Stork**

*Ephippiorhynchus asiaticus*

Whistler (1938), records it as rare in the erstwhile Jodhpur State. I found two on 20 January, 1994 in a large wetland near RD 507, where fish and waterlily roots were being harvested. Beside a large number of waterfowl, it also had a greater spotted eagle.

**20. Black Ibis *Pseudibis papillosa***

Common. Generally found foraging on sand-dunes, grasslands and drying wetlands. Nearly 350 seen on 37 sites during winter and monsoon surveys but none in summer. At least 200 seen with cormorants and egrets on 19 January, 1994, in a large roost on eucalyptus trees near Manaktheda between Suratgarh and Badopal.

**21. White Ibis *Threskiornis melanocephalus***

Not common. Only two seen on a large roost near Manaktheda near Badopal on 19 January, 1994.

**22. Spoonbill *Platalea leucorodia***

Many records. Generally seen on village tanks, but could be spreading with seepage wetlands of the IGNP. On 7 March 1993, 49 birds seen foraging in a wetland near the rest house in Guda-Vishnoian.

**23. Greater Flamingo *Phoenicopterus roseus***

Many records. 1500-2000 in Sambhar Lake on 14 January, 1994. On the same day about 400, including 30 immatures, seen in Didwana. On 19 January, 1994, 380 foraging in Badopal near Suratgarh and 14 (5 immature) on a waterspread near RD 507 on 20 January, 1994.

**24. Greylag Goose *Anser anser***

Rare. Two in Badopal near Suratgarh on 19 January, 1994. Rare in the Thar, Pakistan (Roberts, 1992).

**25. Barheaded Goose *Anser indicus***

Uncommon. Not recorded by Whistler (1938). Roberts (1992), says it is now rare in Pakistani Thar. However, on the Indian side it is still common in some localities such as Taal Chhaper. According to Forest Department figures, 52 were seen in 1990-91, and 125 in 1992-93. Many seen by me on 4 February, 1993. It is reported to occur in Sambhar Lake in large numbers. I could not survey the whole lake. I

saw only two geese on 14 January, 1994, in a small portion of this wetland. However, near Koliya village in Didwana subdivision of Nagaur dist., on 14 January, 1994, 37 were grazing close to human habitation.

**26. Brahminy Duck *Tadorna ferruginea***

Rare in the Thar. Only two in Gajner on 6 February, 1993.

**27. Common Shelduck *Tadorna tadorna*.**

Perhaps the first record from the Thar. I found 22 in Badopal near Suratgarh on 19 January, 1994.

**28. Wigeon *Anas penelope***

Uncommon, but will spread with the development of seepage wetlands beside the IGNP. Already seen regularly near Bajju, on 19 February, 1993, 25 in a wetland at RD 540. Four on Sambhar Lake on 14 January, 1994 and 18 in a village tank near Kolayat on 17 January, 1994.

**29. Gadwall *Anas strepera***

Common in suitable wetlands and village tanks all over the Thar. 142 birds seen on 8 waterbodies, including 50 birds in Gajner tank. There were many more, but all could not be counted due to intervening vegetation.

**30. Common Teal *Anas crecca***

Common in suitable wetlands. A total of 272 teals seen on 11 waterbodies. A total of 96 birds seen on a tank near the resthouse of Guda Vishnoian, and 70 found on a seepage wetland near RD 507 on 20 January, 1994.

**31. Mallard *Anas platyrhynchos***

Uncommon. Four found at RD 954 on 8 February, 1993, and 23 on the same seepage on 21 January, 1994.

**32. Spotbill Duck *Anas poecilorhyncha***

Two in Guda-Vishnoian wetland (7 March, 1993). They have started breeding in the dense



seepage wetlands, overgrown by *Typha*, *Saccharum*, *Phragmites* and *Arundo*. Two adults with chicks in a wetland near RD 954, on 17 July. On 20 January, 1994, 17 were seen on a seepage at RD 507 and two in Cut No. 5 on the same day.

### 33. Pintail *Anas acuta*

Common in all types of wetlands, with other ducks. Sometimes constituting the major proportion of Anatidae. e.g. 156 seen in Gajner on 6 February, 1993; 340 on a seepage wetland at RD 507 on 20 January, 1994, and 97 in Noda Minor on 21 January, 1994.

### 34. Garganey *Anas querquedula*

Uncommon. Fifteen seen in Guda-Vishnoian on 7 March, 1993. Hume (1878), has also reported it from Jodhpur State.

### 35. Shoveller *Anas clypeata*

Like the pintail, shoveller is very common, and spreading due to IGNP. A total of 359 birds seen on 10 wetlands, including 116 on a part of Sambhar Lake, and 110 on Didwana lake.

### 36. Red-Crested Pochard *Netta rufina*

Uncommon but could be spreading with IGNP, e.g. 25 seen on a seepage near RD 507 on 20 January, 1994 and 13 on the main IGNP on 25 January, 1994. There were many more birds all over the main canal but we could not count them.

### 37. Common Pochard *Aythya ferina*

Much more common than the previous species. At least 483 seen on 14 sites. Abundant on the main IGNP and Gajner tank.

### 38. White-eyed Pochard *Aythya nyroca*

Uncommon, but regularly seen every year. Reported by Hume (1878), from Jodhpur, and Roberts (1992), frequently found in Pakistan. I saw only 8 birds in three wetlands i.e. Gajner, Guda-Vishnoian and Kolayat.

### 39. Tufted Duck *Aythya fuligula*

Common in certain deep wetlands such as the Gajner tank where 100 were seen on 6 February, 1993. A few seepage wetlands with deep waters also attract these diving ducks. Nearly 150 were seen near RD 954 on 8 February, 1993, and 70 on 21 January, 1994. A total of 371 seen on 5 sites.

### 40. Demoiselle Crane *Anthropoides virgo*

Thousands on passage during autumn and spring but many stay during winter in suitable localities in the Thar. Two famous areas are Taal Chhaper sanctuary in Churu dist., and Keechan in Jodhpur dist. On 2 February, 1993, we counted nearly 300 in Taal Chhaper. According to records of the Forest Department, in December of 1991, there were 500, in 1992, 1000 and in 1993, 2000. The birds are attracted to feed on tubers of *Cyperus*.

Upto 4,000 are found around Keechan village, near Phalodi, where the villagers have a programme to feed them cereals. Most of the time the cranes wander around near three wetlands or on the sand-dunes, but every morning and evening, during feeding time, they converge on a small area inside the village where cereals are spread.

Seen in other parts of the Thar but not in good numbers, e.g. 22 flew over the Rest House at Shiv, on 5 March 1993, and the same day, on Shiv-Besu road, we saw more than 85 feeding on tubers of *Cyperus* in a fallow field which was earlier inundated during the monsoon. Smaller flocks of 10, 2, 3, 26 were found in nearby fields.

Unlike the common crane, not many demoiselle cranes are found beside the IGNP. I found only 14 in a seepage at RD 954, on 21 January, 1994. The canal and resultant agriculture may have beneficial effect on these cranes, and they are likely to increase in future.

### 41. Common Crane *Grus grus*

This species is spreading in the command area of the IGNP. I saw hundreds near Bajju in

February, 1993. In January, 1994, they were seen at the following sites: 21 between RD 507 and ETF (RD 710); 4 after RD 860; 31 between RD 910 and Dantur; 8 between RD 930 and Bhikampur, and 29 between Bhikampur and Nachna. Ten birds, including two juveniles were seen in Taal Chhaper (4 February, 1993).

**42. Black-shouldered Kite** *Elanus caeruleus*

Common all over the Thar. Seen in all seasons. Seventy-two individuals counted in 35 roadside census by vehicle. Many more noticed on line transects.

**43. Crested Honey Buzzard**

*Pernis ptilorhynchus*

It was not reported from the Thar desert earlier, but now it is colonizing the forest plantations coming up beside the IGNP. A dark phase morph seen in Bajju Plantation on 8 February, 1993 and three seen separately near Bhopalpura plantation on 20 January, 1994. In Sind and Baluchistan (Pakistan), according to Roberts (1991), it has increased with the plantations.

**44. Black Kite** *Milvus migrans govinda*

Commonly seen in winter, but very few records during summer, which indicates that the birds move out of the Thar during adverse conditions.

**45. Blackeared Kite** *Milvus migrans lineatus*

According to Vibhu Prakash (pers. comm. 1994) it occurs in the Thar, but I did not see any.

**46. King Vulture or Red-headed Vulture**

*Sarcogyps calvus*

Still frequent all over the Thar. Seen on most carcasses, with other vultures. 27 birds seen in 18 transects during roadside counts, and many more during line transects and bird walks. One nest each found near Sudasari (2 February) and Ujlan (7 February, 1994).

**47. Cinereous Vultur**

*Aegypius monachus*

Uncommon winter visitor. Twenty-six individuals seen at 13 different sites, generally solitary or in twos; only once four birds seen sitting in shade after feeding on a goat carcass. Most of the carcasses found in winter had 1 - 2 cinereous vultures, along with 1 - 2 king and numerous oriental whitebacked vultures.

**48. Griffon Vulture or Eurasian Vulture**

*Gyps fulvus*

Not uncommon during winter. A total of 52 individuals seen on 12 different sites. In Lakhasar enclosure in Jaisalmer dist., on 7 February, 1994, in the early morning, 18 were seen sitting on *Prosopis cinerarea* (khejri) trees. One tree had 7 birds.

**49. Indian Longbilled Vulture** *Gyps indicus*

Much more common in winter than in summer. Generally seen mixed with whitebacked and Egyptian vultures on carcasses. Probably nesting near Dhorimanna on bare hills as white faecal patches could be seen from the road. Virtually absent, in the Pakistani part of the Thar, except for a few pairs nesting on cliffs on the rocky outcrops in Nagar Parker area (Roberts, 1991), not very far from Dhorimanna.

**50. Indian Whitebacked Vulture**

*Gyps bengalensis*

Appears to be much more common than the previous species. Found on all carcasses which we located. Nests found on old *Prosopis cinerarea* trees during the monsoon in Sikar, Churu and parts of Bikaner dist. A total of 184 birds seen in 30 roadside censuses, and many more during line transects.

**51. Egyptian or Scavenger Vulture**

*Neophron percnopterus*

Very common all over the Thar. A total of 176 individuals seen during 51 roadside censuses. Present on almost all carcasses.



**52. Hen Harrier *Circus cyaneus***

Rare. A male seen near Kalran Sharif on Bap-Khara road on 11 February, 1993, and another on 5 February, 1994, between Sudasari and Jaisalmer.

**53. Pale Harrier *Circus macrourus***

Fairly common winter visitor. A total of 12 seen during line transects and 22 during roadside census. Roberts (1991), also found it to be common in Thar and Cholistan deserts of Pakistan, which borders India. According to him, it is found in more arid areas than those favoured by other harriers.

**54. Montagu's Harrier *Circus pygargus***

Uncommon winter migrant to the Thar. Only seven sightings during winter surveys. Roberts (1991), found it to be the least common harrier in the Thar and Cholistan deserts.

**55. Marsh Harrier *Circus aeruginosus***

Generally in the vicinity of water, so likely to spread with the development of seepage wetlands of the IGNP. All my 14 sightings were close to the canal.

**56. Short-toed Eagle *Circaetus gallicus***

Common. A total of 15 birds seen at 14 sites in all seasons. Except one, all sightings of solitary birds but Shantanu Kumar (*in litt.* 1994), reported seeing 16 in Taal Chhaper on 8-9 September, 1988. On 20 May, 1994, between Dabla and Akal in Jaisalmer dist., on a hot sunny day, two immatures sitting with legs immersed in a small leakage from a water pipe.

**57. Longlegged Buzzard *Buteo rufinus***

One of the commonest buzzards of the Thar. During roadside census by vehicle, two seen at two sites during February-March, 1993, and 29 seen in 17 places during January-February 1994. None noticed in the Thar between 18 and 20 May, 1994. Roberts (1991), also found it to be the commonest buzzard during winter in the arid plains of Pakistan.

**58. Desert Buzzard *Buteo buteo vulpinus***

One drinking water from canal near Mohangarh on 6 February, 1993, and two seen near Radrao near Mohangarh in Jaisalmer dist. exactly a year later.

**59. Tawny Eagle *Aquila rapax vindhiana***

Very common Aquila of the Thar desert. Hume (1878), also found it a very common breeding bird. At least five nests, some with immatures, seen by me. Roberts (1991), reported it breeding all over the Thar and Cholistan deserts. A nest on a *Prosopis cineraria*, with three individuals, 16.8 km before Bap on Kanasar road. Except the nesting branch, the whole tree was lopped. Between Phalodi and Ramdeora on 18 May, 1994, from 1140 to 1300 hrs, four individuals seen. One picking bones from a road kill, along with two Egyptian vultures, two on a waterhole, and one on a pole. On 19 May, 1994, at least 25 tawny eagles visited the waterhole in Sudasari. Sometimes six eagles seen together. During four surveys, 25 birds sighted in 16 areas during roadside censuses.

**60. Eastern Steppe Eagle*****Aquila rapax nipalensis***

A winter visitor in the Thar. One seen inside Sudasari and another near Kolayat in February, 1993. Thirteen birds sighted in 8 areas during roadside census.

**61. Lesser Spotted Eagle *Aquila pomarina***

Probably this species was seen between Ratangarh and Taal Chhaper on 4 February, 1993. It occurs regularly in Bharatpur (Vibhu Prakash, pers. comm. 1994), and unconfirmed records are from Pakistan (Roberts 1991), so it is likely to occur in the Thar. A rare resident in Saurashtra and western Peninsula (Ali and Ripley 1987). Its occurrence in the Thar is not unlikely, though it must be very rare.

**62. Greater Spotted Eagle *Aquila clanga***

This large *Aquila* is invariably found near waterbodies so it is generally absent in the Thar



desert. But with the development of seepage wetlands and congregation of its prey (water birds), it is likely to increase in the Thar. We saw one adult flying on a large waterspread near RD 507 on 20 January, 1994. This waterbody had plenty of fish and ducks. Even a pair of blacknecked stork was present. Whistler (1938), had collected a specimen from Pichiak Lake in Bilara dist. of the erstwhile Jodhpur State. Hume (1878), has also included it in his Jodhpur list. Roberts (1991), has reported it in the Pakistani Thar. He says that they breed occasionally in the better forested areas of the Nara canal and the Indus river.

### 63. **Shikra** *Accipiter badius*

Mainly a species of thin forest and groves, so the Thar desert is not its favoured habitat. However, with the spread of plantations, the shikra will become more common in the desert. I had 10 sightings, generally near the canal. However, two were seen hunting within 5 km of each other in sandy area, in the early morning among tall, dense, widely scattered *Prosopis cineraria* trees, near Mankasar in Jaisalmer dist. Roberts (1991), found it to be resident and largely sedentary throughout the Indus plains, being partial to irrigated forest plantations and better wooded tracts.

### 64. **White-eyed Buzzard-eagle** *Butastur teesa*

Another common raptor, generally seen in winter and monsoon in the Thar. Thirteen birds were seen at 11 sites. None seen during four days survey in May 1994, indicating emigration of birds during the hot summer months. Roberts (1991), also found it abundant during winter in the Thar and Cholistan deserts, and commented "resident with some local summer migration".

### 65. **Saker** *Falco cherrug*

One falcon in flight, perhaps this species, with something thin and long hanging from its talons, probably a leather 'jesses' from an escaped bird trained for falconry.

### 66. **Laggar Falcon** *Falco biarmicus jugger*

The most common resident falcon of the Thar desert, seen in all seasons. Thirty-one individuals, a few in pairs, spotted at 21 different sites. One bird was seen inside Bikaner town on 24 January, 1994. According to T. J. Roberts (*in litt.*, 1994), the Laggar is nearly extinct in Pakistan because trappers use it as decoy to trap peregrine and saker for illegal falcon markets.

### 67. **Redheaded Merlin** *Falco chicquera*

Uncommon, only four sightings during four surveys. Three sightings were in July 1993, during the locust plague: one seen in Taal Chhaper on 13 July, 1993; another near Undu on 25 July, in an area where finchlarks had concentrated in large numbers to feed on hoppers; and third between Undu and Kanasar on 26 July, in locust infested area. Only one bird was seen during the third survey (in Taal Chhaper) on 4 February, 1994. None seen during May 1994, indicating that the birds probably move away from the Thar during summer.

### 68. **Kestrel** *Falco tinnunculus*

Very common winter visitor. Forty-one individuals seen during line transects and 143 birds seen during roadside censuses.

### 69. **Grey Francolin** *Francolinus pondicerianus*

Very common, and probably increasing due to expansion of agriculture. If not molested, seen just outside villages and towns. Present even inside Dholomaru Rest House in Bikaner city !

### 70. **Black Francolin** *Francolinus francolinus*

Earlier not found in the Thar desert, but likely to spread with development of irrigated crop fields and dense hedges among fields. On 15 July, 1993, heard from a crop field between Rosa and Kankarwala near Lunkaransar in Bikaner dist.. Probably the first record of this species from this area. According to Roberts (1991), they are entirely absent from the main desert tracts such as the Thar or Cholistan, but occur in *Saccharum* thickets in the east Nara.



**71. Grey Quail** *Coturnix coturnix*

Common winter migrant. It may breed in the Thar in crop fields during favourable conditions. All my four sightings were of pairs flushed from tall grasses in winter.

**72. Blackbreasted or Rain Quail**

*Coturnix coromandelica*

Abundant during monsoon, depending upon the rainfall and growth of grass. In Taal Chhaper, during the monsoon of 1993, characteristic calls were heard everywhere. Calls were heard in Sudasari enclosure also, but they appeared slightly different in tone. Not seen or heard during winter and summer months.

**73. Indian Peafowl** *Pavo cristatus*

Abundant and spreading with IGNP. Near Gunga village, 7 km before Shiv, 150 peafowls were seen in about 1 sq. km area, during winter of 1994, in totally bare area with no ground cover, but strangely not even one peafowl was seen in the same area on 20 May, at 1600 hrs.

**74. Coot** *Fulica atra*

Perhaps the most numerous water bird of the Thar desert. More than 590 seen in Gajner on 16 January, 1994, and 230 in Kolayat temple tank on 17 January, 1994. Abundant on the IGNP. Near Mohangarh, very common on the main IGNP, wherever submerged vegetation is present. Seen in open waters also. On 31 January, 1994, 325 counted in about 10 km of the canal.

**75. Purple Moorhen** *Porphyrio porphyrio*

Earlier uncommon in the Thar desert but now spreading with the canal and seepage wetlands. Seen during monsoon and winter (I did not visit the IGNP during summer), so there are chances that it has started breeding in *Typha*-infested parts of the canal. Always seen associated with emergent vegetation.

**76. Indian Moorhen** *Gallinula chloropus*

Another beneficiary of canal irrigation and development of waterbodies. Now common, and spreading in the Thar. Present in village tanks with aquatic and emergent vegetation. Avoids open waters. Very common in Gajner and certain parts of the main IGNP with emergent vegetation. Twenty-six individuals seen on the IGNP near Mohangarh in a distance of 10 km (31 January, 1994). Always found close to aquatic vegetation, unlike coot which prefers open water. In July 1993, all adult birds were in breeding plumage, with brick red bill. Sometimes seen in extremely small water tanks, in the middle of the barren desert. For instance, on 24 January, 1994, three birds were seen in a circular cement water-collecting tank, overgrown with *Typha*, in Mankasar village in Bikaner dist.

**77. Great Indian Bustard**

*Ardeotis nigriceps*

Still found in many areas of the Thar, but declining everywhere due to poaching, habitat deterioration, and human disturbances (Rahmani, 1994).

**78. Houbara** *Chlamydotis undulata*

Winter migrant, widespread in very low density in undisturbed areas of the Thar, especially near the border. Still extensively hunted by poachers, both local and outsiders. Only 21 birds seen during January-February 1994, after much effort.

**79. Redwattled Lapwing** *Vanellus indicus*

Numerous records from the Thar. Adaptable and quick to colonize newly created suitable habitats. It will become more common with expansion of agriculture and canals. Common on sewage streams of towns and cities. For instance, at least 50 seen on sewage in Barmer town on 20 May, 1994. Many in brackish wetland near Lunkaransar on 15 July, 1993.

**80. Yellow-wattled Lapwing***Vanellus malabaricus*

Uncommon. Roberts (1991), found it only in Lower Sind in Pakistani Thar. I saw one bird on 16 January, 1994, near Gajner.

**81. White-tailed Lapwing *Vanellus leucurus***

Another uncommon lapwing of the Thar desert but likely to spread with seepage wetlands. I saw it on three sites in 1994: 2 in Gajner on 16 January; 3 in Badopal on 19 January; and 2 in a seepage at RD 507 on 20 January. Roberts (1991), also found it common on the seepage zones of all the major irrigation head works in the Punjab, and the east Nara (Thar), but not from the Cholistan desert.

**82. Cream-coloured Courser***Cursorius cursor*

Common all over the Thar. In 26 roadside censuses, 180 individuals were seen during winter. There seems to be an influx in winter, as they are seen everywhere in flocks of 8-15 in all sorts of habitats, specially in gravel flat areas with 30-40% ground cover. During monsoon, both Indian and Cream-coloured coursers are seen together. On 8 August, 1993, outside the pasture plot in Bap area, many groups of these two species were noticed. Also found on barren ground around *dhanis* (hamlets), littered with goat/sheep pellets on which many insects occur, on which these coursers feed. It is so well recognised that it has a local name *Patpadri*. None seen between 19-20 May, in DNP and other places. It breeds in the Thar in small numbers (Rahmani and Manakadan, 1989).

**83. Indian Courser *Cursorius coromandelicus***

It is found in more mesic habitat than the cream-coloured courser but during monsoon it spreads out in the Thar. Some individuals can be seen during winter also, but none during summer. Out of five records, four were during monsoon. I have only one winter record, when a group of 10 birds was seen foraging in a flat, fallow field,

before Gajner in Bikaner dist. (16 January, 1994). Roberts (1991), has reported it as resident in the Thar desert of Pakistan., but not in Cholistan.

**84. Collared Pratincole *Glareola pratincola***

On 22 July, 1993, I saw five birds in a temporary pool, 7 km before Kanoi in Jaisalmer dist., along with 7 little stints, 3 little ringed plovers and 2 sand plovers.

**85. Stone Curlew *Burhinus oedicnemus***

Call heard in Taal Chhaper on 4 February and 13 July, 1993. As it is secretive and crepuscular, it may be widespread in the Thar. It prefers dry scrub and dunal areas, so it is likely to decrease with the development of agriculture.

**86. Little Stint *Calidris minuta***

Occasional in drying up pools and margins of large village tanks. Seven seen on 22 July, 1993, on a temporary pool near Kanoi.

Roberts (1991), has also noted the first arrival in Lower Sind as early as 21 July.

**87. Temminck's Stint *Calidris temminckii***

Common winter migrant to tanks, drying up pools and recently inundated shallow areas. Commonly seen with Little Stint. Nearly 60-70 seen mixed with Little Stint in Sambhar Lake on 14 January, 1994.

**88. Redshank *Tringa totanus***

Uncommon, but may become widespread in winter with the development of waterbodies along the IGNP. This winter migrant sometimes arrives as early as July. One seen on 20 July, 1993, in Kanasar, which was a very early arrival.

**89. Spotted or Dusky Redshank***Tringa erythropus*

A winter migrant. Three found in the Diyatra tank on 17 January, 1994. Likely to become more common with the development of seepage wetlands along the canal.



**90. Greenshank *Tringa nebularia***

A winter migrant, but one was found on 20 May, 1994, in Barmer town on a sewage stream, with at least 50 redwattled lapwings.

**91. Green Sandpiper *Tringa ochropus***

Occasional on village tanks and seepage wetlands in winter. Sometimes the birds can be seen as early as July. One bird was seen on a temporary pool on 20 July, 1993, and another the same day on another temporary pool. Heavy rains had occurred between 17 and 19 July, in the Thar desert.

**92. Wood Sandpiper *Tringa glareola***

Only once in a tank near Taal Chhaper on 13 July 1993, which is a very early record of this winter migrant. According to Ali and Ripley (1987), wood sandpiper begins to arrive in northern districts in early August. Apparently, overwintering of this species in India is unusual and unrecorded. Therefore, the record of 13 July, is noteworthy.

**93. Common Sandpiper *Tringa hypoleucos***

Fairly common winter migrant to all sorts of wetlands from roadside ditches to margins of large lakes. Likely to increase with the development of suitable habitats along the canal.

**94. Ruff & Reeve *Philomachus pugnax***

Fairly common winter migrant, sometime arriving as early as end-July. Six seen on a temporary pool between Bap and Phalodi on 20 July, 1993, after three days of rain. 20 seen in a small part of Sambhar Lake (14 January, 1994), and more than 100 in brackish waters of Badopal (19 January, 1994), only one in a freshwater lake near Keechan (26 January, 1994).

**95. Blackwinged Stilt *Himantopus himantopus***

Common bird near waterbodies, ditches, temporary pools, and sewage streams of towns and cities. All my records are during monsoon, none in winter. Many individuals were located on a brackish wetland near Lunkaransar (15 July,

1993), and 7 individuals, including two immatures, near RD 954 near Bajju (17 July, 1993), 6 between Bap and Phalodi, and one on a roadside ditch between Bap and Kanasar.

**96. Black-tailed Godwit *Limosa limosa***

Nearly 250 seen on a waterspread near Badopal on 19 January, 1994. Roberts (1991), has recorded it from the Thar in Pakistan, but not in Punjab or Cholistan. However, I have seen it in Badopal, which is in Suratgarh, close to Punjab.

**97. Little Ringed Plover *Charadrius dubius***

Many records both from fresh and brackish waters. It is a resident bird so its presence on 15 July, 1993 on a saltpan near Lunkaransar was not surprising. One seen on a seasonal pool between Bap and Kanasar (20 July). Later three were seen on a temporary pool near Kanoi in Jaisalmer dist. on 22 July. Also recorded on Diyatra, Keechan and Kowadisar tanks.

**98. Kentish Plover *Charadrius alexandrinus***

Found both in fresh and brackish waters — one seen on a salt pan near Lunkaransar (19 January), two in Sambhar Lake which is brackish and two in a freshwater tank near Gajner.

**99. Lesser Sand Plover *Charadrius mongolus***

Only one record of two birds in a temporary pool, on 22 July, 1993, 7 km before Kanoi in Jaisalmer dist. It is mostly found on the sea-coast, with very few records from inland waters (Ali and Ripley, 1987, Roberts, 1991). It arrives on the sea-coast by early August, so the birds which I saw must be on the passage.

**100. Snipe *Gallinago gallinago***

Only one record of two birds in Guda Vishnoian on 7 February.

**101. Avocet *Recurvirostra avosetta***

It is generally found in brackish water. I saw it on three different sites in the Thar desert.

102. **Indian River Tern** *Sterna aurantia*

Two recorded in Guda Vishnoian wetland on 7 March, 1994. One was found dead in the same wetland.

103. **Blackheaded Gull** *Larus ridibundus*

One near Sambhar Lake on 14 January, 1994, and three on a seepage at RD 507 on 20 January, 1994. Roberts (1991), has found it wintering in the Thar desert in Pakistan but not in Cholistan.

104. **Great Blackheaded Gull**

*Larus ichthyaetus*

One confirmed sighting on a seepage wetlands near RD 507 on 20 January, 1994. Probably first record from the Thar. It has not been recorded from the desert regions of Pakistan (Roberts 1991, pp 369, map 178). Ali and Ripley (1987), however, reported it from Bharatpur, Delhi, Nepal, Bihar, Corbett (Uttar Pradesh) so its presence in the Thar, though unusual, is not unexpected.

105. **Common Indian Sandgrouse or Chestnut-bellied Sandgrouse**

*Pterocles exustus*

Abundant all over the Thar.

106. **Spotted Sandgrouse** *Pterocles senegallus*

Uncommon. Sixty seen inside Sam enclosure on 1 February, 1994, and many hundreds outside Sam along with Indian Sandgrouse. Seven were seen on 1 February, between Mohangarh and Jaisalmer. According to Roberts (1991), it is an abundant, but erratically occurring winter visitor to the main deserts of Cholistan in Punjab and Thar in Sind. It appears to be declining.

107. **Imperial Sandgrouse** *Pterocles orientalis*

Common winter migrant. A few thousands still come to Gajner every morning to drink water. e.g. on 16 January, 1994, 3-4 thousand were seen in Gajner. Always found in large numbers from

2-3 hundreds to a few thousands. Extensively hunted, hence declining all over its range.

108. **Blue Rock Pigeon** *Columba livia*

Abundant in villages and settlements. Apparently absent in uninhabited parts of the Thar, but now spreading due to development of plantations. According to Major Harjit Singh, Environment Task Force (ETF) (pers. comm. 1993), pigeons were not seen earlier in this area. They came after ETF was established, and human settlements came up in 1983. Roberts (1991), has not shown its distribution in the Thar and Cholistan deserts bordering the Indian Thar desert. I found them roosting/nesting in abandoned wells and water storage tanks. Huge numbers live around temples where grains are provided daily for birds.

109. **Indian Ring Dove**

*Streptopelia decaocto*

Abundant all over the Thar, especially around Vishnoi settlements where grains are fed daily to birds.

110. **Red Turtle-dove**

*Streptopelia tranquebarica*

Normally not present in very dry, treeless regions but with the development of canals and plantations, this dove is colonizing new areas. During monsoon they appear to be more widespread than during winter and summer. For instance, about 30-40 were found roosting with ring doves on *Acacia tortilis* trees near RD 954 near Bajju on 17 July, 1993. In Mohangarh on 21 July, pure flocks of 12-20 were seen roosting on *A. tortilis* at the edge of a grove, all sitting on 2-3 branches only, not spread out. Red turtle-dove was not seen during winter months in these areas, except for a male which was unable to fly on 29 January, near Tepu village in Jaisalmer dist. In Pakistan it is a summer migrant from India. Roberts (1991), has not recorded it in the Thar or Cholistan deserts, so its occurrence in Mohangarh in Jaisalmer is of significance.



**111. Little Brown Dove***Streptopelia senegalensis*

Much more common than *S. tranquebarica*, but not as abundant as the ring dove. Prefers groves and thickets of *Prosopis* and *Acacia*, and will become more common with plantations coming up with the IGNP.

**112. Yellowlegged Green Pigeon***Treron phoenicoptera*

Hume (1878), reported it from Jodhpur State. It is generally found in groves and forest, so the Thar is not a suitable habitat. However, with the development of plantations, it is being seen in new areas. I saw 8 birds on a tall, dense *Zizyphus* tree, 60 m from an *Eucalyptus* plantation of IGNP near Bajju on 9 February, 1993. At another site, more than 39 were eating the fruit of pipal *Ficus religiosa* near Manakthedi village between Suratgarh and Badopal on 19 January, 1994. On 30 January, 1994 one bird was seen on *Eucalyptus* near Mohangarh. Roberts (1922), also found that this species has extended its range in Pakistan due to plantation.

**113. Roseringed Parakeet *Psittacula krameri***

Earlier uncommon in the Thar desert but now spreading very fast, thanks to cultivation and dense plantations along the canal. On 21 January, 1994, more than 1000 were roosting noisily on tall trees in Bajju. Also noticed in ETF, Mohangarh, Nachna, Bhikampur, and other areas beside the canal. Roberts (1992), found it widespread in the Indus river basin, but not in the Cholistan desert.

**114. Pied Crested Cuckoo *Clamator jacobinus***

A migrant arriving with the start of the monsoon, so all my sightings were during July and August. It prefers scrub, forest and plantations. With the increase in numbers of its chief host i.e. babbler (thanks to thick plantations), it is likely to be found breeding more often in the Thar. I saw 15 individuals on 8 sites in July 1993.

**115. Crow-pheasant or Coucal***Centropus sinensis*

This is another bird of light forests, scrubland and groves so naturally it is not found in very arid areas where such habitats are absent, but with canal side plantations, the crow-pheasant is spreading in the Thar desert. I heard its call near Bajju and saw one bird near RD 954 on 9 February, 1993. During the roadside census, five birds were seen in as many sites.

**116. Short-eared Owl *Asio flammeus***

A winter migrant of the grasslands and thin scrubland. I saw them in three different areas. On 16 January, 1994 in Diyatra region, ten owls were flushed out from an area of about 5 ha and in the same area, 9 individuals were flushed out from about 100 sq. m on 18 January. On 19 January, one was found crushed on the road between Bamanwala and Lunkaransar. In a grove of *Zizyphus* near Sangori village in Jaisalmer dist., on 29 January, 15 short-eared owls were seen, all sitting in the shade of small bushes. Roberts (1991), found it widespread in the desert of Pakistan.

**117. Spotted Owlet *Athene brama***

Common in villages, *dhanis* and old disused wells.

**118. Collared Scops Owl *Otus bakkamoena***

One individual seen at 1945 hrs in a thick *Dalbergia sissoo* grove near Mohangarh 27 July, 1993. According to Roberts (1991), "it is a species which requires good tree cover and is therefore uneven in distribution in the Indus plains, being found mainly in irrigated forest plantations or patches of riverine forest or in the shady gardens of old bungalows. It is entirely absent from desert or open treeless country but odd pairs will turn up in every district of Punjab and Sind". Its presence in a dense grove in the middle of almost treeless desert, (before the construction of IGNP, Mohangarh area was almost treeless) is noteworthy. Like other forest-loving species, the

collared scops owl is certainly going to increase all along the IGNP.

#### 119. **European Nightjar**

##### *Caprimulgus europaeus*

A crushed nightjar was found on the road near Mohangarh (22 July, 1993), from which wing/tail feathers were collected which were later identified in BNHS as those of the European nightjar. Dense groves of *A. tortilis* were present on both sides of the road from where the feathers were collected. R. G. Soni (pers. comm. 1994), has seen this species in the IGNP areas in Bikaner dist. Whistler (1938), had collected specimens from Hamvas in the erstwhile Jodhpur State.

#### 120. **House Swift** *Apus affinis*

Mostly seen during the monsoon. May not be uncommon, but easily overlooked. Nearly 115 individuals seen on nine sites in July 1993. Roberts (1991), has not reported it from the desert regions of Pakistan but Ali and Ripley (1987), have shown its distribution covering the whole of peninsular India, including Rajasthan.

#### 121. **Green Bee Eater** *Merops orientalis*

Common and now spreading with cultivation. Seen in all seasons. Nearly 460 individuals in 51 roadside censuses, out of which 290 were seen during the monsoon. In the Thar, the paler subspecies *beludschicus* is generally seen.

#### 122. **Blue-cheeked Bee-eater**

##### *Merops superciliosus*

Breeds in the Thar during the monsoon so by May and June, the birds start moving in. During July, 210 individuals were seen on 16 roadside censuses. During May 1994, many birds were seen near Osian, Phalodi and Sudasari.

#### 123. **European Roller** *Coracias garrulus*

An autumn passage migrant, seen during July and August. Five individuals seen during July 1993.

#### 124. **Indian Roller** *Coracias benghalensis*

Prefers more mesic habitats than available in the Thar desert but now spreading due to cultivation and plantation. Seen in all seasons. 64 individuals seen during 25 roadside censuses, and many others during line transects. Roberts (1991), says that the Indian Roller is absent from extensive desert tracts, but we found it in many areas in the Thar.

#### 125. **Whitebreasted Kingfisher**

##### *Halcyon smyrnensis*

Although comparatively more independent of water than other kingfisher species, it is still not found very far from water, hence it is not a true desert species. However, it can be seen near permanent village tanks, and now it is spreading all along the IGNP. We have seen it in the following areas: near Bajju, Bangasar Lift Canal at RD 860, Bhikampur, Nidai on Jaisalmer-Mohangarh road, near Mohangarh, ETF, and near Lunkaransar. Additionally, 21 individuals were seen during roadside censuses.

#### 126. **Blackcapped Kingfisher**

##### *Halcyon pileata*

This is not a desert species, but we saw one bird at a village tank near Keechan on 26 January, 1994. This is probably the first record from the Thar desert. Not reported by Hume (1878), Whistler (1938), and Roberts (1991). According to Ali and Ripley (1987), it is primarily a maritime species, but sporadically reported from inland (e.g. Bharatpur, Gonda, Monghyr) so its presence in a wetland in the Thar is not unexpected, though unusual.

#### 127. **Common Kingfisher** *Alcedo atthis*

One bird was seen at a village tank near Kolayat on 17 January, 1994. Associated with wetlands, so the dry Thar is not its main habitat. Roberts (1991), has not reported it in Cholistan desert but only in a small part of the Thar Desert (see Roberts, 1991, pp 514, map 260).



**128. Pied Kingfisher** *Ceryle rudis*

One individual seen inside Suratgarh town on 19 January, 1994. At present rare in the Thar but likely to spread with the IGNP.

**129. Hoopoe** *Upupa epops*

Common in the Thar, but none seen during four days survey during the summer. It generally avoids extensive deserts (Roberts 1991), but during favourable conditions in the rains, it spreads out widely. I saw 26 birds during monsoon and winter on 17 roadside censuses and 11 during line transects.

**130. Wryneck** *Jynx torquilla*

Found in open scrubland and thin forests during winter. I saw one individual feeding on the ground in a plantation, about 2 km before Dedawa, on Gandhav-Dedawa road in Nagaur dist.

**131. Yellowfronted Pied Woodpecker***Picoides mahrattensis*

This species is also found in scrub forests, and it is likely to increase with the spread of *Acacia* plantations. I saw two on *Prosopis cinerarea* near Rolsabsar, Fatehpur tehsil in Sikar dist., on 4 February, 1993, and later the same day a female on *Prosopis cinerarea* in Taal Chhaper in Churu dist. On 14 January, 1994, one woodpecker was seen, 6 km before Nawan in Nagaur dist. in a *Prosopis cinerarea* grove on a hillock. In Phulia enclosure of DNP in Jaisalmer, a circular hole was found on a *Salvadora* trunk, about 3 m high, which appeared to be of a woodpecker, but we did not see any woodpecker in this area. Roberts (1991), found it resident in the sparse *Prosopis spicigera* thorn scrub of the Thar desert in Pakistan.

**132. Lesser Golden-backed Woodpecker***Dinopium benghalense*

This species of woodpecker is found from scrub forest to thick deciduous forest of the Himalayas. Whistler (1938), collected specimens from Jawa and Jaswantpura in the erstwhile Jodhpur

State. We saw one individual foraging on *Prosopis cinerarea* near Rolsabsar, Fatehpur Tehsil, Sikar on 4 February, 1993. R. G. Soni (per. comm. 1994), has reported it from Bikaner dist.

**133. Redwinged Bush Lark***Mirafra erythroptera*

It is found in the broader valleys and eroded hills of the Thar desert (Roberts 1992). Whistler (1938), collected specimens near Hamavas lake. Hume (1878), considered it common in Jodhpur. Ali and Ripley (1987), recorded its presence in western Rajasthan (Thar), and northern Gujarat, including Kutch dist. I saw it only once near Fakeran ki dhani in Jaisalmer dist. on 31 January, 1994.

**134. Ashycrowned Finch Lark***Eremopterix grisea*

It is generally not present in the drier parts of the Thar, but during monsoon it tends to spread out all over the Thar. According to Roberts (1992), it is "locally nomadic, dispersing into remoter desert areas in the monsoon season". Whistler (1938), collected it in Pali, Bhinmal and Jalor but Hume (1878), did not collect any in Jodhpur. We found it to be common inside Sudasari enclosure during July (monsoon) but absent during May (summer). However, during winter some were seen in a dry area near Khetoosar, near Kanasar in Jodhpur dist. (28 January, 1994). Out of 191 seen during roadside census, 170 were sighted during July, and the rest during winter.

Near Undu, in Barmer dist. on 25 July, during a locust plague, more than 100 were seen feeding on hoppers in about 200 m area on the metalled road. They did not gulp the hoppers, but battered them to small pieces and then ate the pieces.

**135. Blackcrowned Finch Lark***Eremopterix nigriceps*

Very common in the Thar. Breeds during the monsoon. Many males displaying during July

and August. Regularly seen during May in all the places studied.

**136. Rufoustailed Finch Lark**

*Ammomanes phoenicurus*

Very common in Taal Chhaper during monsoon. According to Roberts (1992), it is largely absent from the more arid northwest (in Pakistan), but I found it fairly common in the Thar during the monsoon. Out of the 168 birds seen during 17 roadside censuses, 159 were seen during monsoon. On 25 July, 1993, some birds were seen feeding on locusts. On a hot noon on 26 July, between Kashmira and Makhab in Barmer dist., the telegraph wires were full of finch larks, including the rufous-tailed.

**137. Hoopoe or Bifasciated or Large Desert Lark** *Alaemon alaudipes*

A bird of extremely hot and barren areas. The Thar is the easternmost limit of this widely distributed species in the Middle East and northern Africa. I have seen it on four sites, all flat and very arid: between Jaisalmer and Sam; near Digha; near Dholiya; and in Sanghana ki Basti near Dhanana. It breeds during the monsoon in July, as a male was found displaying between Jaisalmer and Sam. Before aerial display it sings softly and then jumps about 3 m, and falls with closed wings. White flashes are seen on the wings when ascending. Near Dholiya village, on 28 January, 1994, many were seen feeding on roots of *Dactyloctenium indicum*.

**138. Greater Short-toed Lark**

*Calandrella brachydactyla* (Leisler)

or **Short-toed Lark**

*Calandrella cinerea longipennis* (Ali & Ripley).

Abundant during winter, in flocks of upto one thousand. Sometimes moves with the eastern calandra lark. It appears to be partial to grasslands and feeds on grass seeds, e.g., about 300 were found feeding on seeds of *Aristida funiculata* in very short grass.

**139. Eastern Calandra Lark**

*Melanocorypha bimaculata*

An erratic winter visitor, enormous flocks in some years, while largely absent in others. During February 1993, huge flocks seen all over the Thar, but especially in Diyatra, Phalodi, Bap, Khara, and Sam areas. Sometimes moves with equally huge flocks of short-toed larks.

**140. Crested Lark** *Galerida cristata*

In some areas very common, as between Bikaner and Kolayat on 17 January, 1994, 30 seen in a distance of 20 km, foraging on the road on fallen grains. Specially common in fine, sometimes extremely dry, gravel areas. During winter and monsoon surveys, 203 birds were counted in 29 roadside censuses. Not seen during May, so probably moves to more mesic areas during summer.

**141. Eastern Skylark** *Alauda gulgula*

Hume (1878), found it in Jodhpur. I have a few sightings of this species. On 19 February, 1993, I saw two birds near Bhikampur which appeared to be this species. They had very faint breast streaks, almost invisible, and two black markings on either side of neck, conspicuous crest, erect posture, and long flesh coloured tarsus. They were foraging at 1230 hrs on the roadside, on bare stony ground. In July a few individuals, perhaps of this species, were seen in Taal Chhaper and Sudasari.

Confirmed sighting of three birds near Tanwarwala in Jaisalmer on 24 January, 1994. They were in a sandy area, moving restlessly on the ground, picking up seeds. Sometimes sitting on top of *Aerva* and eating seeds from standing shrubs.

**142. Plain Sand Martin** *Riparia paludicola*

A nesting colony was found on a sand bank near Mohangarh on 4 March, 1993. Another active colony was found 200 m from IGNP, in a sand bank on 25 January, 1994. White on the belly extends upto breast unlike in PICTORIAL GUIDE



(Ali and Ripley, 1983) where white is shown only on the belly.

**143. Swallow *Hirundo rustica***

Fairly common winter visitor to the suitable biotopes in the Thar desert. It may spread widely due to cultivation and canal irrigation. We saw one near Bajju on 8 February, 1993, another near a brackish wetland near Lunkaransar on 15 July, 1993, which is very early for this species. Roberts (1992), say that they can be found in the plains from August onwards, so my record is much earlier.

**144. Wiretailed Swallow *Hirundo smithii***

Found in the vicinity of water. Earlier it may not have been common in the Thar, but now it is spreading along the canal. Roberts (1992), has not recorded it in the Cholistan and Thar deserts of Pakistan (map 309, pp 40, vol. 2) but I saw it at four different sites near the IGNP: two birds were seen near Bajju on 17 July; a loose group of 20 between RD 931 and RD 961; a solitary bird between Bajju and Bhikampur (both on 18 July); and the fourth sighting of three birds was near Mohangarh on 21 July.

**145. Indian Cliff Swallow *Hirundo fluvicola***

At Bhikhampur in Jaisalmer dist. we saw many birds collecting nesting material and probably nesting under a bridge over the main canal (10 February, 1993). According to Roberts (1992), the Indian cliff swallow is largely confined to the Indus plains, but in recent years it has colonized many new areas. Similar colonization is being seen on the IGNP.

**146. Common Wood Shrike**

*Tephrodornis pondicerianus*

Unlike true shrikes, it is entirely arboreal in foraging, thus found only in scrubland and open forests with trees. According to Roberts (1992), in Pakistan it frequents old plantations around canals. Whistler (1938), found it common in the tamarisk forest in Tilwara in Jodhpur estate. One seen in a plantation near Bajju.

**147. Small Minivet *Pericrocotus cinnamomeus***

This species was not recorded by Hume (1878), or Whistler (1938), from the Thar, but I sighted four birds on 4 February, 1993, on a roadside plantation near Rolsabsar, Fatehpur tehsil in Sikar dist. Second sighting was on 14 January 1994, near Nawan (Nagaur dist.) in a scrubland. According to Roberts (1922), it is well adapted to irrigated cultivation, plantations. (map 330, pp 77, vol. 2, shows this species on the Pakistani Thar side of Gadra Road, (Gadra Road is in Barmer).

**148. Whitebellied Minivet**

*Pericrocotus erythropygius*

Hume (1878), collected it near Jodhpur, and Adam near Marot and Koochamun. I saw a pair foraging on *Acacia* at a roadside plantation near Rolsar (Fatehpur Tehsil, Sikar) on 4 February, 1993.

**149. Whitecheeked Bulbul**

*Pycnonotus leucogenys leucotis*

Abundant, prefers drier habitat than *cafer* (Roberts 1992). In addition to birds seen during line transects and general studies, nearly 320 birds were sighted during 68 roadside censuses.

**150. Redvented Bulbul *Pycnonotus cafer***

One of the most common birds of the Thar. Earlier it was absent from the more extensive desert tract (Roberts 1992), where its place was taken by whitecheeked bulbul but now it is spreading with canal irrigation. It was noticed on 55 roadside census paths, and a total of 204 individuals were seen.

**151. Black Drongo or King Crow**

*Dicrurus adsimilis*

Widespread during winter and monsoon, invariably found following sheep and goats. More than 200 individuals seen during 43 roadside censuses during winter and monsoon, but none during summer months.



**152. Indian Tree Pie *Dendrocitta vagabunda***

One seen on a *Prosopis cinerarea* tree in a crop field between Sambhar and Nawan in Nagaur on 14 January, 1994. Likely to spread with thick plantations which are coming up beside the IGNP.

**153. House Crow *Corvus splendens***

Commensal with human beings, so present around *dhanis* and villages. Generally uncommon in remote uninhabited areas. Breeds during monsoon months. Numerous pairs with young ones seen in July and August.

**154. Raven *Corvus corax***

In the plains of India, the raven is found only in the Thar, where it replaces the jungle crow. I saw 104 birds during 33 roadside censuses. Many more were seen during line transects and general studies. During summer months, there appears to be emigration from the more arid parts of the Thar to less arid, because during May no raven was seen between Jodhpur, Phalodi, Jaisalmer and Shiv. The first raven was seen 5 km before Dhorimanna, which is not a true desert country, being more hilly and vegetated. After Dhorimanna, many ravens were noticed. They were sometimes seen in flocks on garbage near filthy roadside hotels or on animal carcasses with vultures.

**155. Common Babbler *Turdoides caudatus***

Very common. Wherever a few *Capparis* bushes are present, this species is seen. Scattered bushes appear to be a critical habitat factor in the Thar. More than 650 individuals were counted in 83 roadside censuses. It was present practically all over the Thar.

**156. Large Grey Babbler *Turdoides malcolmi***

Not found in very dry parts of the Thar. Common in Jodhpur, the Luni basin and western foothills of the Aravalli mountains. Its distributional line runs from Gajner (Bikaner) to Fetehpur-Ratangarh (Churu-Sikar) to Taal Chhaper (Churu) up to Lohawat (Jodhpur) and

Jaitaran-Bilada (Jodhpur) to Dhorimanna (Barmer). From Lohawat to Jodhpur this species is seen in increasing numbers. The Gajner population appears to be isolated. According to Roberts (1992), it is not so well adapted to semi-desert regions as *T. caudatus*, nor does it like such well-wooded regions as *T. striatus*. The large grey babbler is likely to increase its range with the development of plantations along the canal.

**157. Jungle Babbler *Turdoides caudatus***

This is also a forest-loving babbler, so naturally it was absent from the Thar. Whistler (1938), had collected it from Sunda Hills in Aravallis in the erstwhile Jodhpur State but he did not observe it elsewhere. However, with the development of excellent plantations and undershrubs along the canal, this species is spreading. I have seen it feeding on roadside plantations near Mokulsar between Arjunsar and Rajaisar (19 January, 1994). On both sides were good *Eucalyptus* and *A. tortilis* plantations, and sugarcane crop. One flock was seen between Gopalsar and Bakhtavarpura on 20 January, 1994, near IGNP. One found crushed on the road, about 1 km from Bajju. Its companions sitting around the dead body. Good *Eucalyptus/tortilis* plantation present nearby. Later 6 seen in the same area on 25 January, 1994. One more flock was seen in a dense eucalypt of IGNP near Chhatargarh (15 July, 1993). All these sites were near IGNP in Bikaner dist.

**158. Striated Babbler *Turdoides earlei***

This is a typical riverine species, present along the larger rivers of north India and the Indus river system. Therefore, its presence along the IGNP is quite interesting. First evidence was a flock among *Arundo* reeds in a jheel of RD 954 on 17 July, 1993. They showed typical skulking behaviour. Presence of fledglings begging for food proved that the birds had bred in the areas. On 20 January, 1994, another flock was seen among *Arundo* growing in a seepage wetland of IGNP between Bakhtavarpura and Bhopalpura.



*Arundo*, which was flowering, extended many metres on both sides of the canal. The rest of the canal was covered with water hyacinth. The third group of 8-10 was seen on 29 January, 1994, on a seepage with *Typha*, *Arundo* and *Saccharum*, 14 km before Chinnu and 16 km after Bhikampur. They were 200 m from the main IGNP. Roberts (1992), says that it is found all along the Indus river and its tributaries, but has adapted and spread along major irrigation canal systems in Pakistan.

#### 159. **Bluethroat** *Erithacus svecicus*

A common winter migrant to the foothills and plains of north India, extending in decreasing numbers to south India. Prefers shaded, damp areas, so the dry Thar is not the main habitat of this bird. However, with the development of crop fields and plantations in the Thar, the bluethroat is now increasingly being seen. I saw a male in Taal Chhaper in Churu dist., a male and female in Mohangarh in Jaisalmer dist. (6 February, 1993), and again one on the lawns of Mohangarh Rest House on 6 February, 1994.

#### 160. **Rufous Chat** *Erythropygia galactotes*

A passage migrant through Pakistan and northwest India to East Africa, passing through the Thar during monsoon and autumn. Whistler (1938), says they appear in September in Jodhpur but I saw many individuals on 24 and 25 July, 1993 in Sudasari enclosure in Jaisalmer. They were going from bush to bush, fighting among themselves, regularly cocking and fanning the tail.

#### 161. **Black Redstart** *Phoenicurus ochruros*

Common in winter, generally found in shaded areas. According to Roberts (1992), it shuns open bare regions and likes tree plantation avenues. I have seen it in extremely arid areas also, e.g. near Nokh on 10 February, 1993, a female redstart was seen in an arid area, under two *Capparis* bushes, with a lesser whitethroat. The area can be considered super arid, with very scattered bushes and flat barren *rann* nearby. I saw 76 individuals during 24 roadside censuses.

Both subspecies *phoenicuroides* (grey crown) and *rufiventris* (black crown) were seen in Bajju in February 1993.

#### 162. **Magpie Robin** *Copsychus saularis*

Another new entrant to the arid regions of the Thar along with canal irrigation, cultivation and plantations. We saw a female inside ETF on 20 January, 1994, and another female between Bajju and Bhikampur on 25 January, 1994. Ali and Ripley (1987), and Roberts (1992), have not reported it from the arid regions of the Thar.

#### 163. **Brown Rock Chat** *Cercomela fusca*

An endemic Indian bird, irregularly distributed in the Thar. Whistler (1938), reported it to be common at Phalodi, Jalore and on the Sunda Hill. Robert (1922), does not report it from the Thar in Pakistan. I found it very common in Keechan village near Phalodi in Jodhpur dist.

#### 164. **Indian Robin** *Saxicoloides fulicata*

The Indian Robin is generally absent from very dry areas of Jaisalmer, Jodhpur and Bikaner. It is more common near the Aravalli mountains. Its distribution in the Thar more or less follows the distribution of the large grey babbler, but sometimes isolated populations are found, such as I saw in Sankara village, in Jaisalmer (7 February, 1992). One bird in rocky, stony areas between Phulia and Jaisalmer (26 February, 1993), and another between Bikaner and Lunkaransar (19 January, 1994), were also seen. Not seen between Phalodi and Osian, but between Osian and Jodhpur, it was frequently seen as I proceeded towards Jodhpur.

#### 165. **Stoliczka's Bushchat** *Saxicola macrorhyncha*

Rare, localized and endemic to the northwestern arid and semi-arid parts of India. Roberts (1992), considered it extinct in Pakistan. However, no survey has been done there. I found it fairly common in Diyatra, DNP, Nokh, and Khara areas. Altogether 86 individuals were seen at 18 sites (Rahmani, 1993).



**166. Collared Bushchat *Saxicola torquata***

Fairly common winter visitor to the Thar. Roberts (1922), found it all over the Pakistani Thar. I also saw it in many areas. Whistler (1938), collected it at Hamavas, Jalore and Bhinmal.

**167. Pied Bushchat *Saxicola caprata***

Common resident in suitable areas. Whistler (1938), found it very common in Jodhpur State. I found it frequently during monsoon and winter but not during the four days of a summer survey. In Sudasari on 24 July, a male in heavy moult; head and neck whitish with some black feathers. Middle tail feather missing, so tail appeared forked. Faint wing patch, belly whitish, and rump also white. Later, two immatures were seen in the same area. I collected specimen of a dead juvenile; only the skeleton was present, but both wings and tail feathers were undamaged. Immatures had conspicuous wing and black tail. Upper parts and head blotched. The bill was black and the rump chestnut.

**168. Isabelline Chat *Oenanthe xanthopyrma***

Common winter visitor throughout the more barren and uncultivated tracts of the Indus plains (Roberts, 1992). Very generally distributed except in the hill tracts (Whistler, 1938). I saw 35 individuals during 14 roadside censuses, and many more during line transects. Most sightings generally in open, barren sandy or gravel areas, but one bird was found foraging near a hamlet (*dhani*), very tame, sometime perching on house walls.

**169. Desert Wheatear *Oenanthe deserti***

Perhaps the commonest wheatear of the Thar desert, reported to be very common in Barmer and Phalodi (Whistler, 1938). I had hundreds of sightings during winter. Aerial display was seen on 27 February, 1993 inside Sam enclosure.

**170. Pied Chat *Oenanthe picata***

Another common winter migrant to the Thar desert. It has three morphs: Blackbellied *opistholeuca*, Whitebellied *picata* and White-

crowned *capistrata*. All three morphs seen, sometimes within 100 m of each other, but the *picata* morph most frequently. The earliest arrival, a *picata* morph male, was sighted on 23 July, in Sudasari enclosure in the DNP.

**171. Red-tailed Wheatear**

*Oenanthe xanthopyrma*

The rarest *Oenanthe* of the Thar desert. Only ten individuals seen in two winter surveys of one month each. Generally found in dry, sandy or gravelly arid areas. Roberts (1992), found it to be locally common in Pakistan, but rather selective in the areas it chooses.

**172. Indian Great Reed Warbler**

*Acrocephalus stentoreus*

Very common in the IGNP. It breeds mainly in central Asia, sporadically in Pakistan (Roberts, 1992), but I found it breeding during July all along the main IGNP canal. Very common on *Typha* near RD 954, and all along the IGNP wherever *Typha* clumps were present. On 17 July 1993, seen or heard every 200 m. Strangely seen only on the IGNP, not in the jheel of RD 954. Near Nachna (20 July), every patch of *Arundo/Typha* in the IGNP had a warbler. Whistler (1938), said "abundant in the extensive reed beds of Hamavas Lake... it is extremely probable that the birds breed where they were found". During five roadside censuses along the IGNP in July, 96 birds were noted.

**173. Rufous-fronted Wren Warbler**

*Prinia buchanani*

Addicted to semi-desert tracts thickly studded with *Zizyphus* bushes. Specimens were collected from Phalodi, Tilwara, Jalor and Hamavas Lake (Whistler, 1938). Robert (1992), found it common in the Thar. It is a resident species and I found it in many places.

**174. Streaked Wren Warbler *Prinia gracilis***

We saw one in Sudasari on 27 July, 1993, and four between Mohangarh and Jaisalmer on 1 February, 1994.



**175. Plain Wren Warbler *Prinia subflava***

A largely sedentary species found throughout the Indus plains. It is adapted to cultivated tracts, particularly irrigated tall crops such as wheat, cotton, sorghum and millet (Roberts 1992). Not reported by Whistler (1938), but I found some in fallow fields, between Bap and Phalodi on 10 February, 1993. Another was seen calling agitatedly from the top of a *Capparis* bush inside Sudasari enclosure (1 March, 1993). Later, in Mohangarh on 4 March, one was seen in breeding plumage. During the monsoon, we noted it at Taal Chhaper (13 July), in a plantation, and in a crop field near Lunkaransar (15 July, 1993).

**176. Orphean Warbler *Sylvia hortensis jerdoni***

A winter visitor, likely to occur in roadside thorny plantations and scrubland. I saw one on 1 February, in Sam, and a female (head not black) in a roadside plantation between Bikaner and Gajner (17 January, 1994). One more was seen in Diyatra region on 18 January. Hume had collected it at Jodhpur. Whistler (1938), called it *S. crassirostis jerdoni*.

**177. Desert Lesser Whitethroat***Sylvia curruca minula*

Widespread in the Thar, in low scrub and bushes. Whistler (1938), called it *S. c. minuta*. It occurs in the same habitat as *Sylvia nana*. Another subspecies *blythi* very common in *Acacia* plantations in Punjab and Sind (Roberts, 1992). This subspecies is likely to spread with canal irrigation and development of canal plantations. Whistler (1938), collected it from Hamavas Lake in Pali, Sunda Hill, Jalor. I saw lesser whitethroat in many roadside plantations and low scrub growing among sand dunes.

**178. Desert Warbler *Sylvia nana***

Common in winter all over low scrub and uncultivated tracts in the desert. Invariably seen following a wheatear, lesser whitethroat or some other small bird. Display call heard/seen at 0820 hrs in Sudasari enclosure on 3 February, 1994.

**179. Streaked Fantail Warbler***Cisticola juncidis*

Common in open bog or marshy grasslands. Erratic distribution due to habitat restrictions. Not found in the dry areas of the Thar. It will spread with cultivation. I saw it displaying over a salinized field overgrown with *Cyprus* near Bajju (18 July, 1993). Also seen in another similar field. Later, display seen in Sudasari enclosure on 24 July, 1993.

**180. Booted Warbler *Hippolais caligata***

Roberts (1992), has reported two subspecies from the Thar desert: *caligata* is largely a passage migrant, while *rama* breeds in Baluchistan and erratically in the riverine tracts of Sind, and winters throughout the Indus plains. Whistler (1938), collected *rama* (Syke's tree warbler), in Hamavas Lake, and said that they are probably passage migrants. Both subspecies are likely to occur in the Thar. R. G. Soni (pers. comm. 1994), has reported it from Bikaner.

I saw four warblers, possibly this species, foraging in *Acacia tortilis* grove near Mohangarh on 27 July, 1993, constantly calling *chirr chirr*. All in the same tree at the edge of a dense grove, they were bigger than lesser whitethroat, closer to house sparrow in size, with longish bill, white supercilium joining forehead, underparts pale whitish, while upper part earthy brown (as in juvenile babbler). Legs whitish. Sometimes hovering to catch insects.

**181. Brown Leaf Warbler or Chiffchaff***Phylloscopus collybita tristis*

Winter visitor in shrubs, bushes, light forests, groves and hedges. According to Roberts (1992), it prefers irrigated canal colonies and well wooded areas in Punjab and Sind and it is abundant in the Indus plains. Whistler (1938), collected it from Hamavas Lake and Tilwara. I saw it in Taal Chhaper (4 February, 1993). Probably this species was seen on 25 February, 1993, inside Miyajlar enclosure where three individuals were foraging separately among low



*Tamarix* bushes. Later, this species was seen inside Phulia enclosure (25 February), in plantation near Mohangarh (4 March, 1993), and in the ETF plantation (21 January, 1994). With the establishment of plantations and crop fields, it is likely to increase in IGNP areas.

#### 182. Tailor Bird *Orthotomus sutorius*

It was largely absent in the Thar, but now due to cultivation and plantation it is spreading. I heard call in Bajju on 21 January, 1994. According to Whistler (1938), it was not observed west of Tilwara, and Roberts (1992), says that it usually shuns extensive areas of desert, but is frequently found on the edge of barren desert.

#### 183. Grey Shrike *Lanius excubitor*

The most common shrike of the Thar desert, it was seen in most of our roadside censuses. 515 individuals were seen in 82 censuses. In July 1993, one shrike was found pecking at a snake of about 84 cm. Another was seen on a cow carcass near Mohangarh on 31 January, 1994. Four fledglings were found with parents in the DNP office in Jaisalmer on 18 May, 1994. The nest was located on the thatched roof of an abandoned hut. A pair was seen probably nesting on a pole between Jodhpur and Mathaniya (18 May, 1994), reluctant to fly from the nest site. There were lots of bushes in the vicinity, so why should it nest on the open pole?

#### 184. Baybacked Shrike *Lanius vittatus*

This shrike avoids pure desert country, preferring scrubland and plantation, so it is not uniformly distributed in the Thar unlike *L. excubitor*. However, it is likely to increase with the ecological changes brought about by the IGNP. Even Whistler (1938), had reported it from Barmer and Pholodi, and in most rest house gardens. Roberts (1992), found that it particularly prefers canal-bank tree plantations. I have seen it in Ralsabsar (4 February 1993), Taal Chhaper (4 February), 2 km before Dedwa in a roadside plantation on Shiv-Dhorimanna road

(12 February), and on Sudasari-Khuri (2 March, 1993). During the monsoon survey, it was seen in many plantations, e.g. between Khara and Jamsar, (15 July), near Lunkaransar (15 July), near Bajju (17 July), near RD 961 near Bajju (18 July), (all in Bikaner dist.); Sudasari enclosure (24 July), (Jaisalmer dist.); between Harsani-Balewa (25 July), Undu (26 July), and Dhorimanna (26 July), (all in Barmer dist.).

During the winter survey of 1994, I had only one sighting i.e. in *Acacia tortilis* plantation and crop fields near Lunkaransar (19 January). It was seen during the summer survey, also indicating that it may be resident. One bay-backed shrike was found in a green crop area and plantation between Mathaniya-Osiyan (18 May), (Jodhpur), another between Barmer and Dhorimanna (20 May).

A shrike of bay-backed size, with very dark head like Burmese shrike, was seen on 17 July, 1993, near RD 954 near Bajju.

#### 185. Rufousbacked Shrike *Lanius schach*

Like *L. vittatus*, the rufousbacked shrike also avoids very arid tracts and dunal areas. It prefers cultivation, gardens, scrubland and plantations. Whistler (1938), found it at Phalodi, Gadra Road and Barmer. It is another beneficiary of the IGNP. I found it in many canal plantations and scrubland. Evidence of its breeding, two juveniles were located with an adult near RD 954 on 17 July, 1993, in Bikaner.

#### 186. Pale Brown Shrike *Lanius collurio* or Isabelline Shrike *Lanius isabellinus*

According to Whistler (1938), common in all the drier parts; the classification of these two species/subspecies is still arguable. I had many sightings during winter and monsoon but not during summer.

#### 187. Whitebrowed Fantail Flycatcher *Rhipidura aureola*

A bird of thin forests, scrubland, orchards and gardens. According to Whistler (1938), it is



not found west of Balotra, but this statement is no longer valid due to ecological changes brought about by canal irrigation in the Thar. According to Roberts (1992), it is common in the irrigated canal colonies of the Punjab. In lower Sind, it is mainly found in relict patches of riverine forest or in orchards.

I have seen solitary birds in many areas in Bikaner dist. e.g. in a plantation near Bajju (9 February, 1993 and 23 January, 1994); near RD 820 (21 January, 1994); Mohangarh (4 March, 1993); plantation/crop near Lunkaransar (15 July, 1993); and near Chhatergarh in IGNP plantation (15 July). I did not go to the IGNP areas during the summer survey of 1994, so I do not have any record nor do I know whether it is found in this area in summer.

#### 188. **Paradise Flycatcher**

##### *Terpsiphone paradisi*

Not noted by Whistler (1938), but Roberts (1992), found that it occurs over most of Sind and Punjab as a double passage migrant. I saw a female chasing a little green bee-eater in a *Tecomela undulata* grove, about 1 km from the Forest Department rest house near Mohangarh in Jaisalmer dist. On the other side of the road was a thick grove of *Dalbergia sissoo*.

#### 189. **Tawny Pipit *Anthus campestris***

Common winter migrant, but Whistler (1938), did not procure it in Jodhpur State. We have many sightings which could be due to recent spreading of this species: Taal Chhaper (4 February, 1993); Katar-Jasrasar in Churu (5 February, 1993); Sudasari Rest House (1 March, 1993); outside Sudasari enclosure (2 March, 1993); Undu (5 March, 1993); Diyatra (18 January, 1994); sandy area near Damodra pasture Plot (1 February, 1994); one very dark bird near Sam (2 February, 1994); inside Sudasari enclosure and 4 birds outside Sudasari (3 February) and one Digha Minor (6 February, 1994). We saw 24 more birds during 11 roadside censuses during January-February 1994, most solitary individuals.

#### 190. **Brown Rock Pipit *Anthus similis***

Not listed by Whistler (1938), but we found it in four different sites in 1994. A bird was seen on the way to Nokh from Bhikampur (25 January). In Jaisalmer dist. we saw this species at the following sites: two birds near Fakeran ki dhani (31 January), one near Khuri (2 February) and two birds inside Sudasari enclosure (3 February). Roberts (1992), has not reported it from the Pakistani Thar and Cholistan (Vol. II, pp 53, map 316) but Ali and Ripley (1987), have shown its occurrence in the whole of Gujarat and Rajasthan.

#### 191. **Yellow Wagtail *Motacilla flava***

Common passage migrant. I saw one individual in a seepage of IGNP, 10 km after Lunkaransar in Bikaner on 19 January, 1994.

#### 192. **Blackheaded Yellow Wagtail**

##### *Motacilla melanogrisea*

Hume (1878), refers to it as *M. feldegg malanogriseus* while Roberts (1992), calls it *M. flava melanogrisea*. One individual, probably of the species was sighted near IGNP.

#### 193. **Yellow-headed Wagtail or Citrine Wagtail *Motacilla citreola***

One seen on the edge of Bangas Lift canal near Bajju, 9 February, 1993. It is generally found on larger marshes and wetlands, foraging on the floating vegetation. Roberts (1992), has recognised three subspecies. Hume (1878), received skins of *M. c. calcarata* from Jodhpur.

#### 194. **Grey Wagtail *Motacilla cinerea***

Frequently found in relict patches of riverine forest where there are drainage channels or oxbow lakes. Reported by R. G. Soni (pers. comm. 1994), from Bikaner. I saw one on a saltpan near Lunkaransar in Bikaner dist. on 19 January, 1994.

#### 195. **White or Pied Wagtail *Motacilla alba***

Invariably found near water, so it is absent from the greater part of the Thar. This winter migrant is likely to be seen more frequently with



the spread of canal network. All the following sightings were near IGNP or on village tanks: Bajju (8 February, 1993); Bangasar Lift Canal (9 February); Bhikampur (10 February); Guda-Vishnoian (7 March, 1993); and in a village tank near Samra, 3 km from Nokh (28 January, 1994). Roberts (1992), has not reported it from Cholistan and Thar deserts.

**196. Large Pied Wagtail**  
*Motacilla maderaspatensis*

This species is found on streams, rivers, canals and at the margin of large lakes. Roberts (1992), found it sparingly in Punjab and the lower stream debouching into the Indus, but absent from most of Sind. He has not reported it from the Thar and Cholistan deserts. I have seen it on five sites: IGNP near Bajju (9 February, 1993); Nachna (20 July, 1993); seepage wetland near Bhadera village, 10 km after Lunkaransar (19 January, 1994); one foraging on a bridge of IGNP near ETF (20 January, 1994); and on an old camel carcass with common babbler, feeding on insects and maggots, near Noda Minor (21 January, 1994).

**197. Brahminy Myna *Sturnus pagodarum***

Earlier reported only from the edge of the Thar desert. Hume (1878), considered it fairly common in Jodhpur and Whistler (1938), collected it from Pali, Hamavas Lake and Jalor. But now it appears that this species has spreaded to some towns in the interior desert region. For instance, I have seen many individuals foraging inside Phalodi town (19 July, 1993), and have many records from the edge of the Thar desert, e.g. a pair seen between Fatehpur-Ratangarh (4 February, 1993); one bird between Jasrasar-Kakra in Churu dist. (5 February); a pair near Dhawa-Doli (6 March); another pair between Jodhpur and Bilada (7 March); and 6 between Ringas and Sikar (12 July); a pair near Dhorimanna (26 July, 1993); a pair between Sambhar and Nawan in a crop field (14 January, 1994); 1 bird between Alai and Nokha (Nagaur)

on 15 January; a pair between Osiyan and Jodhpur (10 February); a pair between Jodhpur and Mathaniya (18 May, 1994); and, one bird, 2 km before Dhorimanna (20 May, 1994). R.G. Soni (pers. comm. 1994), has occasionally seen Brahminy Myna in Bikaner dist.

**198. Rosy Pastor *Sturnus roseus***

Common autumn and winter migrant, but erratically distributed in the Thar desert, perhaps due to lack of suitable foraging areas in winter. Between Bikaner and Gajner on 6 February, 1993, I found hundreds of rosy pastors sitting inside *Zizyphus* bushes feeding on fruit, while in January 1994, not many were seen at the same spot. On 8 February, 1994, hundreds of rosy pastors with bank myna, ring dove and pigeon were seen feeding on capsicum kept for drying near Mathaniya village in Jodhpur dist. The bird menace was so great that boys were employed to chase them away.

Rosy pastors arrive as early as July in huge numbers, but most of them move to other areas. Out of 1089 birds seen during 21 roadside censuses in winter and monsoon, 925 were counted during the monsoon.

**199. Starling *Sturnus vulgaris***

Another common winter migrant, but erratically distributed in the Thar due to lack of foraging areas. It is likely to spread with the expansion of cultivation and irrigation facilities. Most of our sightings were near the IGNP, e.g. more than 2000 bank and common mynas and starlings were found roosting on *A. tortilis* in ETF on 20 January, 1994 in Bikaner dist.

**200. Pied Myna *Sturnus contra***

According to Roberts (1992), it is largely absent from the "dry northwestern parts" i.e. Thar in Pakistan. Whistler (1938), had also not recorded it in Jodhpur State. It is generally found at the edge of the Thar. R. G. Soni (pers. comm. 1994), has seen it occasionally in Bikaner dist. I have a confirmed sighting of two



plied mynas in a fishing settlement near 5 No. Cut near Suratgarh and again inside Suratgarh town on 20 January, 1994. Both these sites in Ganganagar dist. are at the edge of the main Thar desert.

**201. Bank Myna *Acridotheres ginginianus***

Roberts (1992), thinks that the Bank Myna avoids deserts or dry rocky country and it is most common in rice cultivation. It has increased with extension of rice cultivation and also water-logging and seepage zones. In the Indian Thar desert also, it has increased, and is sometimes found in very dry areas. On 11 February, 1993, I found a large flock foraging on flowering and fruiting *Capparis* bushes, in the middle of very dry area, 17 km from Phalsund in Jaisalmer dist. However, most of my sight records are close to IGNP and in crop fields. A very large roost of bank and common mynas was present on *Arundo* and *Typha* clumps at RD 954 near Bajju (8 February, 1993). Another huge multi-species communal roost consisting of more than 2000 mynas was found on *A. tortilis* plantation near ETF on 20 January, 1994 in Bikaner dist..

The bank mynas breed during the monsoon. We found numerous pairs with juveniles in Bikaner dist. during our monsoon surveys. Scattered pairs were occasionally seen following livestock in Khara-Jaimsar in Bikaner (15 July); 4 between Ratangarh and Chhaper (4 February, 1993); a pair between Sendwa and Bidasar in Bikaner (5 February, 1993); a pair in Mankasar villager in Bikaner (24 January, 1994); cultivation/habitation before Dantur (24 January, 1994); a pair with cattle near Sam (6 February, 1994). I also found hundreds of bank mynas with ring doves, pigeons and rosy pastors, feeding on capsicum seeds kept for drying near Mathaniyan in Jodhpur dist. (8 February, 1994).

152 bank mynas were seen during 17 roadside censuses, out of which 129 were seen during monsoon on six transects.

**202. Common Myna *Acridotheres tristis***

Abundant, commensal with man, so found even in remote settlements, but largely absent in uninhabited areas. Nearly 170 individuals, mostly in pairs, were seen in 47 roadside censuses.

**203. Purple Sunbird *Nectarinia asiatica***

It is found mainly in *Calotropis* dominated areas. According to Roberts (1922), in the Pakistani desert, it shows erratic movement in all seasons, because of its partial dependence on flower nectar, and in winter there is a general drift southward. When the false caper *Capparis aphylla* is in bloom, it can be encountered far out in the desert (Roberts 1992). During the roadside census, we saw 160 sunbirds, out of which 112 were seen during monsoon over 14 censuses. Interestingly, no sunbird was seen during the summer visit, thus indicating emigration. The sunbirds probably move to the Thar desert at the onset of the monsoon and remain through winter, till spring. In summer they leave the area due to lack of sufficient food. However, territorial fights and calls were heard during late February and March.

**204. Whitethroated Munia**

*Lonchura malabarica*

The most common munia of the Thar desert, it is abundant near temples where cereals are spread for birds. On 27 July, 1993, in Sudasari, nest building was observed over an old cupshaped nest of some other species. On 7 February, 1994, in Ramdeora enclosure, four munias sitting just below an active nest of steppe eagle on a *Zizyphus* tree (4 m), must be roosting under the nest. A total of 236 birds were seen in 34 roadside censuses.

**205. Green Munia *Amandava formosa***

Probably the first record of this species from the Thar desert, when I saw one on *Capparis* in Sudasari enclosure on 24 July, 1993. Despite its rarity, the green munia is caught for pet bird trade. It could have been an escaped bird. However, Suresh C. Sharma (*in litt.* 1993), has seen it on 29 and 31 March, 1991, in Taal Chhaper sanctuary

in Churu dist., so there appears to be some movement of this bird in the Thar desert.

**206. House Sparrow *Passer domesticus***

Abundant around settlements and remote *dhanis*. Large flocks during winter, whence population is augmented by winter migrants. Sometimes associated with yellow-throated and spanish sparrows.

An albino house sparrow was seen in a market in Nachna on 19 July, 1993.

**207. Spanish Sparrow *Passer hispaniolensis***

The Spanish sparrow was not reported from the Thar desert by Ali and Ripley (1987), but Roberts (1992), has reported it in winter in the Pakistani Thar and Cholistan deserts just across the IndoPak border (closer to Bikaner and Jaisalmer dists of India). R. G. Soni (pers. comm. 1994), has seen it occasionally in Bikaner dist.

I have seen this species, with migrant (?) house sparrows, on three sites. Two males were noticed on 10 February, 1993, with 200-300 house sparrows at 0750 hrs feeding on seeds, 20 km from Phalodi. The next day, two males were seen with a flock of 100 house sparrows between Phalodi and Khara. The third sighting was of two males and two females, with a large group of house sparrows and short-toed larks drinking on leakage of water at 0945 hrs outside Sudasari enclosure (2 March, 1993).

**208. Yellowthroated Sparrow**

*Petronia xanthocollis*

Resident, widespread and specially abundant around villages in old community forests (*Uran*) of *Zizyphus* and *Acacia*, where they can get good nesting holes. Also common around temples where cereals are spread for birds.

**209. Baya *Ploceus philippinus***

This species is invariably found near waterbodies, so it is not common in the Thar. However, it is most likely to spread to more areas

with the IGNP. We saw a small nesting colony near the forest rest house in Taal Chhaper on 13 July, 1993, in Churu district, and four birds between RD 931 and RD 961 on 18 July, and nearly 20 birds between RD 507 and ETF, in Bikaner dist.

**210. Streaked Weaver Bird *Ploceus manyar***

Like the baya, it is also found near water, so it not widespread in the Thar at present. R. G. Soni (pers. comm. 1994), has found it occasionally, in Bikaner dist. It is likely to increase with IGNP, for the reasons cited earlier. Whistler (1938), reported it from Jodhpur State. Roberts (1992), found it throughout the Indus flood plains and its tributaries and the increase in irrigated rice cultivation seems to have favoured its spread. Far much more addicted to seasonal inundation or permanent swamps because of its nesting habit. I found it nesting on *Typha* reeds growing in the main IGNP near Bajju (18 July, 1993).

**211. Redheaded Bunting *Emberiza brunniceps***

Roberts (1992), found it mainly in northern Sind and southern Punjab on passage. The passage route taken by this species is different from the blackheaded. Whistler (1938), collected it in Jalor, and Hume (1878), at Pali and Soojat. I saw two birds between Bap and Phalodi on 10 February, 1993, and three on *Capparis* between Sudasari and Sam, on 1 March, 1993.

**212. Greynecked Bunting**

*Emberiza buchanani*

Whistler (1938), collected it near Phalodi and Pali but Roberts (1992, pp 577, map 564) does not show it in the Thar and Cholistan deserts. On 24 January, 1993, I saw 50-60 birds were seen between Dandkalan and Jarakri in Jaisalmer dist. in very sandy area.

**213. Striolated Bunting *Emberiza striolata***

Hume (1878), found it in Jodhpur on the flanks of a rocky hill, and Whistler (1938),



collected it from Jalor. According to Roberts (1992), it avoids sand dune and open gravel, and is found in rocky hills. On 8 February, 1994, I saw 8 birds on a heap of stones near Lohawat temple in Jodhpur dist.

#### ACKNOWLEDGEMENTS

The first survey of the Thar Desert in February-March was funded by a donation of £500 by Cygnus Wildlife Holidays through the Oriental Bird Club. My sincere thanks to Cygnus, OBC and special thanks to Carol Inskipp. The second and third surveys of the Thar desert were funded by the WWF-I, through their Community Biodiversity Conservation Movement Programme. I am grateful to them for the funds. My sincere thanks to Dr. S. P. Sinha, formerly of WWF, for giving impetus to this project. Some surveys were also funded by the Grassland Ecology Project, jointly conducted by the BNHS and the Centre of Wildlife & Ornithology (CWO) AMU, Aligarh. I am grateful to Prof. A. H. Musavi, Chairman, CWO, and Dr. Jay Samant, Director, BNHS. The Grassland Ecology Project was funded by the US Fish & Wildlife Service. I want to thank Mr. David Ferguson, Office of

International Affairs, Washington, USFWS, and Prof. Mark Behan of University of Montana. I am also grateful to Mr. Vicky Nanda, Ms. Alice Pandya, Mr. W. Clark Price and Ms. Kira M. Glover of the Science Section, US Embassy, New Delhi.

I am also grateful to the Rajasthan Forest Department for cooperation during my surveys. My special thanks to Mr. R. G. Soni with whom I had stimulating discussions, and to Mr. Harsh Vardhan of Tourism & Wildlife Society of India, Mr Chandra Singhji Bhatti and Mr. Dalip Singh of Bikaner, and Mr. Prakash Jain of Keechan village. My sincere thanks to all the forest guards, watchmen and villagers who helped me during the surveys.

I am also grateful to Mr. J. C. Daniel, Mr. M.K. Himmatsinhji and Dr. T. J. Roberts for their stimulating letters and encouragement; Mr. Jugal Kishor Tiwari for useful discussion; Carl D'Silva, Brij Bhushan Sharma, Yogesh Dubey, Rajat Bhargava and Manoj Kulshreshtha who accompanied me during the surveys and Zafar-ul Islam for computer work. Lastly, I want to thank my driver and field companion Mehboob Alam for help during the surveys.

#### REFERENCES

- ADAMS, R. M. (1873): Notes on the birds of the Sambhar Lake and its vicinity. *Stray Feathers* 1: 361-404.
- ADAMS, R. M. (1874): Additional notes on the birds of the Sambhar Lake and its vicinity. *Stray Feathers* 2: 337-341.
- ALI, S. & S. D. RIPLEY (1983): A Pictorial Guide to the Birds of the Indian Subcontinent. BNHS & Oxford University Press, Mumbai.
- ALI, S & S. D. RIPLEY (1987): Compact Handbook of the Birds of India and Pakistan. 2nd edn. Oxford University Press, New Delhi.
- BARNES, H. E. (1886): Birds nesting in Rajpootana. *J. Bombay nat. Hist. Soc.* 1: 38-62.
- BARNES, H. E. (1888-90): Nesting in Western India. (7 parts). *J. Bombay nat. Hist. Soc.*, vols. 3-5.
- BUTLER, E. A. (1875): Notes on the avifauna of Mount Aboo and northern Gujarat. *Stray Feathers*, 4: 1-41.
- BUTLER, E. A. (1876): The avifauna of Mt. Aboo and north Guzerat. Addenda. *Stray Feathers* 5: 207-236.
- CHATTERJI, P. S. & S. K. SAXENA (1988): Canal irrigation in arid zone of Rajasthan and its ecological implications. *In Desert Ecology*. Ed. I. Prakash. Scientific Publishers, Jodhpur.
- DHIR, R. P. (1988): Flux in the Indian Arid Zone. *In Desert Ecology*. Ed. I. Prakash, pp 15-36. Scientific Publishers, Jodhpur.
- DOIG, S. (1879): Birds nesting on the Eastern Nara (Sind). *Stray Feathers* 8: 369-379.
- DOIG, S. (1880): Birds Nesting on the Eastern Nara. Sind. Additions and Alterations. *Stray Feathers* 9: 277-282.
- EATES, K. R. (1937): A Note on the Distribution and Nidification of the Northern Yellow-fronted Pied Woodpecker (*Leiopicus mahrattensis blanfordi*) in Sind. *J. Bombay nat. Hist. Soc.* 39: 628-630.

- EATES, K. R. (1939): A note on the resident owls of Sind. *J. Bombay nat. Hist. Soc.* 40: 750-755.
- GUPTA, R. K. (1975a): Plant Life in the Thar. *In* Environmental Analysis of the Thar Desert. Eds. R. K. Gupta & I. Prakash. English Book Depot, Dehra Dun. pp 202-236.
- GUPTA, R. K. (1975b): Man in the Thar. *In* Environmental Analysis of the Thar Desert. Eds. Gupta, R. K. & I. Prakash, English Book Depot, Dehra Dun. pp 48-69.
- HUME, A. O. (1873): Contribution to the ornithology of India: Sind II. *Stray Feathers* 1: 44-290.
- HUME, A. O. (1877a): (Notes about Pratincola species in India). *Stray Feathers* 5: 130-132.
- HUME, A. O. (1877b): Notes on some of our Indian stonechats. *Stray Feathers* 5: 239-244.
- HUME, A. O. (1878): The birds of a drought. *Stray Feathers* 7: 52-68.
- MANN, H. S. (1988): Future of the Indian Desert. *In* Desert Ecology. Ed. I. Prakash. Scientific Publishers, Jodhpur. pp 307-313.
- PRAKASH, I. AND P. K. GHOSH (1963): The Great Indian Bustard in Rajasthan desert. *Newsletter for Birdwatchers*, 3: 4.
- PRAKASH, I. AND P. K. GHOSH (1964): The Great Indian Bustard breeding in Rajasthan. *Newsletter for Birdwatchers*, 3: 2.
- RAHMANI, A. R. (1989): The Uncertain Future of the Desert National Park in Rajasthan, India. *Environmental Conservation* 16(3): 237-244.
- RAHMANI, A. R. (1994): Wildlife situation in the Thar desert. Report submitted to World Wide Fund for Nature, New Delhi.
- RAHMANI, A. R. & R. MANAKADAN (1989): Breeding records of the Cream-coloured Courser from India. *J. Bombay nat. Hist. Soc.* 86: 447.
- RANA, B. D. , A. P. JAIN, AND R. S. TRIPATHI (1994): Avian Biodiversity in an arid environment. (Abstract). Meeting on Gaps in researches on the Faunal diversity in the Thar Desert. Jodhpur March 1994.
- ROBERTS, T. J. (1991): The Birds of Pakistan. Vol 1. Oxford University Press, Karachi.
- ROBERTS, T. J. (1992): The Birds of Pakistan. Vol 2. Oxford University Press, Karachi.
- SHANKARNARAYAN, K. A. (1988): Ecological degradation of the Thar Desert and Ecoregeneration. *In* Desert Ecology. Ed. I. Prakash. Scientific Publishers, Jodhpur. pp 1-3.
- TICEHURST, C. B. (1922-24): The Birds of Sind. Pt I-VIII *Ibis*.
- WHISTLER, H. (1938): The ornithological survey of Jodhpur state. *J. Bombay nat. Hist. Soc.* 40: 213-235.